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VAUXHALL

CONVERSION GUIDELINES

NEW COMBO

Opel / Vauxhall - Light Commercial Vehicles

EDITION: JUNE 2012

NOTE: Subject to errors and technical amendments. The electronic version of the Conversion Guidelines is the decisive source for the up-to-date data on Conversion Guidelines

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FOREWORD

This publication is designed to provide the information, specifications and instructions for the fitting out and conversion of vehicles. It is aimed at qualified, specialist personnel.
The outfitter is responsible for the project, the fitting out or the conversion and its execution. They should guarantee that it conforms to the instructions in this publication and to the laws in force.
Before carrying out any operation, check that you have the publication for the vehicle model in question. Also make sure that all safety equipment such as goggles, helmet, gloves, shoes, etc. as well as working, lifting, transportation equipment, etc. are ready and in working order. Also ensure that the vehicle is in a position that it is safe to work on.

The outfitter should carry out the operations closely following the instructions given here, using the components indicated and guaranteeing that the operation is technically correct.

Any modification, conversion or anything not set out in this manual and not expressly authorised, in writing, by the manufacturer, will result in the manufacturer not being responsible in any way. In particular, if the vehicle is under warranty, this will immediately be forfeited.

The Manufacturer is not responsible for carrying out the conversion or fitting out operations.
The data and information contained in this publication may not be up to date as a result of modifications made by Manufacturer, at any time, for technical or commercial reasons or the need to adapt the vehicle to meet legal requirements in different countries.
In the case of conflict between the information given here and the actual vehicle, please contact the manufacturer before proceeding to carry out any operation.

Symbols - Warnings

Danger to persons
Failure to follow these instructions fully may lead to serious danger to people's safety

Danger of serious damage to the vehicle
Failure to follow these instructions fully may lead to serious damage to the vehicle and may sometimes also result in the warranty being forfeited

General danger
The dangers of both signals described above accumulates

Safeguarding the environment
This indicates the correct behaviour to follow so that the use of the vehicle has the least negative effect on the environment

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AIM OF THE FITTING OUT DIRECTIVES

The aim of these guidelines is to illustrate how to carry out modifications and/or fitting out to original manufacturer motor vehicles, safeguarding the operation, safety and reliability of the actual motor vehicle and its components.

RESPONSIBILITY

All approvals given by the manufacturer relate exclusively to the technical/conceptual feasibility of the modification to be carried out on the vehicle. The converter remains responsible for;

- The modification project
- The choice and specification of the products/materials used
- The execution of the modification
- The conformity of the project and carrying out all the instructions supplied by the manufacturer
- Operation, safety and reliability, in general, of the vehicle as well as the effects that the modification can have on the performance and specification of the vehicle

WARRANTIES

The guarantee that all work carried out by the converter is properly completed, in full compliance with the rules given in these guidelines, should be undertaken by the converter. The manufacturer reserves the right to invalidate the warranty for the vehicle if

- The guidelines are not followed or an unauthorised conversion is carried out
- An unsuitable chassis is used
- Genuine spare parts or components made available by the manufacturer are not used

REQUESTS FOR APPROVAL

Requests for approval or support to carry out operations or conversions should be forwarded to the manufacturer's local sales team. In order to gain approval, the converter should provide suitable documents that illustrate the planned conversion and its usage.

It is the responsibility of the converter to present the conversion plans to the appropriate authorities to gain approval.

BRANDS AND TRADEMARKS

All brand logos and trademarks on the vehicle should not be altered in order to maintain the image of the vehicle. The manufacturer's approval must be given if a converters logo is to be added. This logo must not be positioned close to the manufacturer's logo.

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LEGAL REQUIREMENTS

When the vehicle is complete, the outfitter should check that the operations carried out (modifications, fitting of structures, etc.) meet all the legal requirements of the country where the vehicle will be registered (e.g. weights, dimensions, braking, emissions, and noise levels).

The vehicles described in this manual meet EEC directives; this must continue after the operations have been carried out. A possible exception would be cases where local homologation, other than EEC, is carried out.

SEAT BELT MOUNTINGS

Operations carried out in areas near seat belt mountings may alter their compliance with EEC certification and therefore the person carrying out the conversion should always check that the laws in force are met.

SEATS

The mounting of the seats to the structure of the floor must comply with the laws in force relating to restraint systems.
If they are moved in relation to the original version neither the safety of the passengers nor the quality of the conversion is guaranteed and therefore this is not permitted.

INTERIOR SHELVING

This should be designed and produced so that the shelving is self-supporting and strong.
The interior support should involve the floor support structure (cross members and longitudinal side members) and should be designed so that the load is evenly distributed.
The mounting of the side structure, produced without creating pre-loading effects, should involve:

- The box section pillars
- The upper connecting side members

INTERIOR FITTINGS ON VAN VERSION

If the load compartment of a van with panels has to be fitted out, it is advisable to leave the outside air vents to allow the rear doors to be closed more easily.

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FRONT CARPETS

If you wish to use a different front carpet from the original on the floor of the driver's side cab, we advise that you ensure it does not interfere with or limit the travel of the pedals (accelerator, brake, and clutch).

OPERATIONS ON THE VEHICLE STRUCTURE

The instructions and the precautions described in the previous paragraphs must be followed.
In particular, it should be remembered that:

- When drilling non-structural box sections, avoid those areas where the stresses are mainly concentrated
- The openings for mountings to the floor should be protected and sealed against water, dust and gas penetration.

AMBULANCES

Great care should be taken to ensure:

- The addition of interior side and under-roof panels use the existing mounting areas and openings in the body, both on the cross-members and the side members, avoiding cuts and holes that could weaken the structure.
- A check to analyse that the application and usage of medical instruments and equipment do not interfere with the basic vehicle electrical/electronic systems.

ACCIDENT PREVENTION

The structures and devices fitted to the vehicles should conform to the regulations in force for accident prevention and to the safety standards in the individual countries where the vehicles will be used.

All precautions dictated by technical knowledge to avoid operating failures and defects should also be adopted.

The manufacturers of the structures and the devices are responsible for observing these precautions.

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CHOICE OF MATERIALS USED - RECYCLING

Increasing attention needs to be paid to the choice of materials used for a conversion during the design and planning stages. This is particularly important for aspects linked to ecology and recycling and also in the light of national and international standards for the sector that are under constant development.

Below are points on the subject:

- The use of materials that are dangerous to health or present a possible health risk such as those containing asbestos, lead, halogen additives, fluorocarbons, cadmium, mercury, hexavalent chrome, etc. is forbidden.
- Use materials which produce limited amounts of waste when worked with and that can be easily recycled after their initial use.
- Make the marks requested to comply with the regulations in force.

DELIVERY OF THE VEHICLE

Before the vehicle is handed over to the final customer, the outfitter should:

- Check that the conversion and/or fitting out has been carried out correctly
- Check the operation and safety of the vehicle and/or the fitting
- Prepare and provide the necessary instructions for servicing and maintaining the fitting
- Add the new information to the appropriate plates
- Provide confirmation that the operations carried out comply with the instructions supplied by the manufacturer of the vehicle and with legal requirements
- Supply a warranty for the modifications made

The vehicle leaves the factory with the Logistic Mode (LM) function activated.
By deactivating certain electrical loads such as the radio, courtesy lights, main beam headlamps, etc., this function allows the battery charge to be preserved whilst the vehicle is stored.
It is possible to tell whether or not the LM function is activated by the battery warning light in the instrument panel flashing.

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VEHICLE IDENTIFICATION

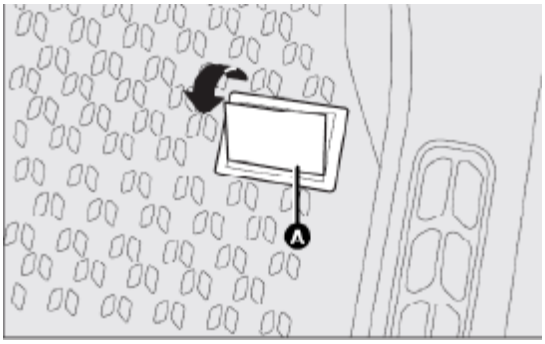
We recommend making a note of the identification codes for each vehicle that is worked on.
The following identification codes are printed and shown on the plates:

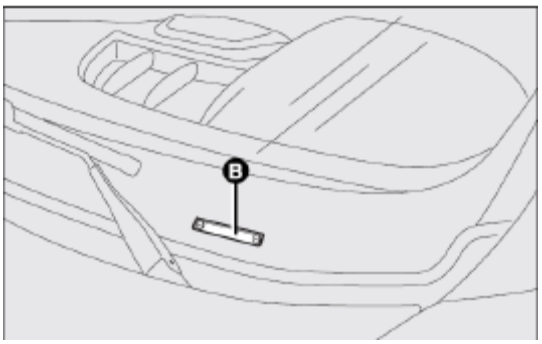
- Chassis marking
- Engine marking
- V.I.N. plate

Chassis marking

The VIN is located in the following areas:

- Passenger compartment floor near the front right seat. For access, lift open the flap - A
- On the lower part of the windscreen - B





Engine marking

Stamped onto the cylinder block showing the type and the manufacture serial number.

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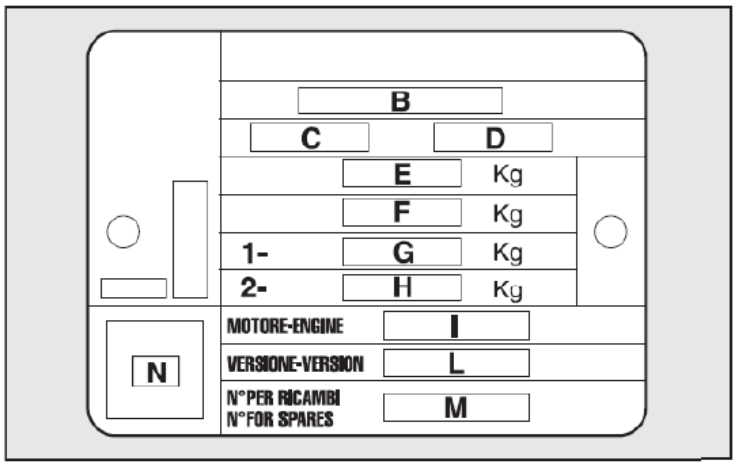
V.I.N. plate

The plate is fitted at the back of the engine compartment and contains the following data:

B Homologation number.
C Vehicle type identification code.
D Chassis manufacture number.
E Maximum authorised weight of the vehicle fully laden.
F Maximum authorised weight of the vehicle fully laden plus trailer.
G Maximum authorised weight on the first axle (front).
H Maximum authorised weight on the second axle (rear).
I Engine type.
L Bodywork version code.
M Spares number.
N Correct smoke coefficient value.



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THE RANGE

The range of vehicles dedicated to conversions consists of the following versions:

- Flatbed
- Van
- Tour N1
- Tour

Short wheelbase Van

Long wheelbase Van

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Short wheelbase, High roof Van

Short wheelbase Tour N1 / Tour

Long wheelbase Tour N1

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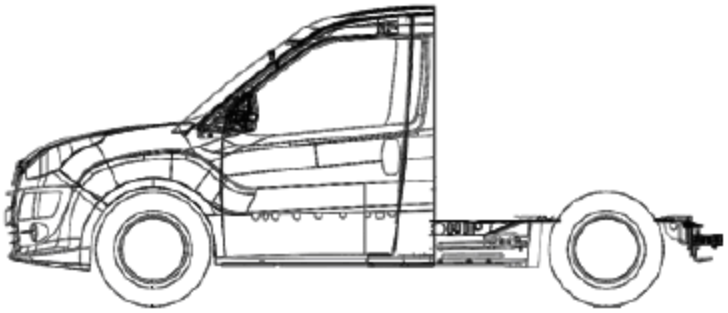
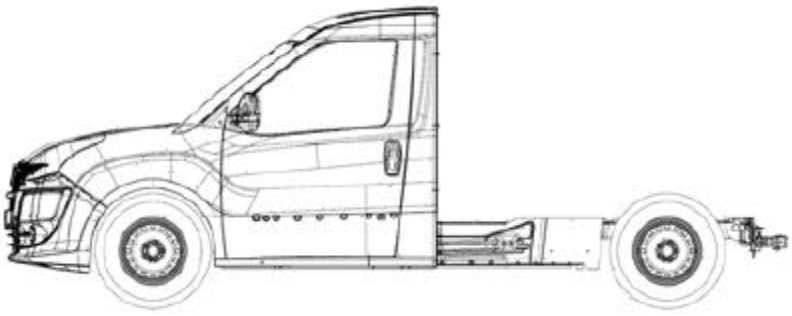
Short wheelbase, High roof Tour

Short wheelbase Flatbed



Long wheelbase Flatbed



The diagrams listed are for illustration purposes only. For the dimensions/measurements of the range, consult the "Main Dimensions" chapter.

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MAXIMUM PERMITTED WEIGHTS

The overall weight of the vehicle and the maximum permitted weights on the axles are given in the tables below. The tare weights refer to vehicles in Std. A configuration (weight of the vehicle empty with 90% fuel).

The combined total of front and rear axle loads must not exceed the permissible gross vehicle weight. For example, if the front axle is bearing its maximum permissible load, the rear axle can only bear a load that is equal to the gross vehicle weight minus the front axle load. The technical data is determined in accordance with European Community standards. We reserve the right to make modifications. Specifications in the vehicle documents always have priority over those given in this manual.

The fitting of special equipment may result in variations to the weights and their distribution on the axles. Before carrying out a conversion, it is advisable to check the weight of the vehicle empty and its distribution over the axles.

The following limits to the weight distribution are required to ensure the dynamic performance of the vehicle is maintained for usability, safety and reliability reasons.

- Front axle: weight on the ground always between 70% and 40% of the total weight of the vehicle on the ground
- Rear axle: weight on the ground always between 30% and 60% of the total weight of the vehicle on the ground.

[All weights that follow in kilograms, kg.]

Model	SWB Van				
Engine Type	**1.4 Petrol**	**1.3CDTi**	**1.6CDTi**	**1.6CDTi Tecshift**	**2.0CDTi**
EMPTY WEIGHT (STD. A)	1240	1270	1310	1310	1350
FRONT AXLE	730	790	835	835	870
REAR AXLE	510	480	475	475	480
PAYLOAD WITH DRIVER	750	750	750	750	750
PAYLOAD EXCLUDING DRIVER	675	675	675	675	675
MAXIMUM PERMITTED LOAD					
FRONT AXLE	1090	1090	1090	1090	1120
REAR AXLE	1140	1140	1140	1140	1140
TOTAL	1990	2020	2060	2060	2100

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Model	SWB Van + Increased payload (OPT RQ6)				
Engine Type	1.4 Petrol	1.3CDTi	1.6CDTi	1.6CDTi Tecshift	2.0CDTi
EMPTY WEIGHT (STD. A)	1260	1290	1330	1330	1370
FRONT AXLE	725	785	830	830	865
REAR AXLE	535	505	500	500	505
PAYLOAD WITH DRIVER	900	1000	1000	1000	1000
PAYLOAD EXCLUDING DRIVER	825	925	925	925	925
MAXIMUM PERMITTED LOAD					
FRONT AXLE	1090	1090	1090	1090	1120
REAR AXLE	1450	1450	1450	1450	1450
TOTAL	2160	2290	2330	2330	2370

Model	SWB Van, High roof			
Engine Type	1.4 Petrol	1.6CDTi	1.6CDTi Tecshift	2.0CDTi
EMPTY WEIGHT (STD. A)	1260	1330	1330	1370
FRONT AXLE	740	845	845	880
REAR AXLE	520	485	485	490
PAYLOAD WITH DRIVER	750	750	750	750
PAYLOAD EXCLUDING DRIVER	675	675	675	675
MAXIMUM PERMITTED LOAD				
FRONT AXLE	1090	1090	1090	1120
REAR AXLE	1140	1140	1140	1140
TOTAL	2010	2080	2080	2120

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Model	SWB Van, High roof + Increased payload (OPT RQ6)			
Engine Type	1.4 Petrol	1.6CDTi	1.6CDTi Tecshift	2.0CDTi
EMPTY WEIGHT (STD. A)	1280	1350	1350	1390
FRONT AXLE	735	840	840	875
REAR AXLE	545	510	510	515
PAYLOAD WITH DRIVER	900	1000	1000	1000
PAYLOAD EXCLUDING DRIVER	825	925	925	925
MAXIMUM PERMITTED LOAD				
FRONT AXLE	1090	1090	1090	1120
REAR AXLE	1450	1450	1450	1450
TOTAL	2180	2350	2350	2390

Model	LWB Van				
Engine Type	1.4 Petrol	1.3CDTi	1.6CDTi	1.6CDTi Tecshift	2.0CDTi
EMPTY WEIGHT (STD. A)	1300	1330	1370	1370	1410
FRONT AXLE	745	805	850	850	885
REAR AXLE	555	525	520	520	525
PAYLOAD WITH DRIVER	900	1000	1000	1000	1000
PAYLOAD EXCLUDING DRIVER	825	925	925	925	925
MAXIMUM PERMITTED LOAD					
FRONT AXLE	1090	1090	1090	1090	1120
REAR AXLE	1450	1450	1450	1450	1450
TOTAL	2200	2330	2370	2370	2410

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Model	SWB Tour N1				
Engine Type	1.4 Petrol	1.3CDTi	1.6CDTi	1.6CDTi Tecshift	2.0CDTi
EMPTY WEIGHT (STD. A)	1350	1380	1420	1420	1460
FRONT AXLE	750	815	850	850	870
REAR AXLE	600	565	570	570	590
PAYLOAD WITH DRIVER	710	710	710	710	710
PAYLOAD EXCLUDING DRIVER	635	635	635	635	635
MAXIMUM PERMITTED LOAD					
FRONT AXLE	1090	1090	1090	1090	1120
REAR AXLE	1310	1310	1310	1310	1310
TOTAL	2060	2090	2130	2130	2170

Model	SWB Tour N1 + Reinforced suspension (OPT F87)				
Engine Type	1.4 Petrol	1.3CDTi	1.6CDTi	1.6CDTi Tecshift	2.0CDTi
EMPTY WEIGHT (STD. A)	1360	1390	1430	1430	1470
FRONT AXLE	750	815	850	850	870
REAR AXLE	610	575	580	580	600
PAYLOAD WITH DRIVER	800	800	800	800	800
PAYLOAD EXCLUDING DRIVER	725	725	725	725	725
MAXIMUM PERMITTED LOAD					
FRONT AXLE	1090	1090	1090	1090	1120
REAR AXLE	1450	1310	1310	1310	1450
TOTAL	2160	2190	2230	2230	2270

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Model	LWB Tour N1				
Engine Type	1.4 Petrol	1.3CDTi	1.6CDTi	1.6CDTi Tecshift	2.0CDTi
EMPTY WEIGHT (STD. A)	1400	1430	1470	1470	1510
FRONT AXLE	770	835	870	870	890
REAR AXLE	630	595	600	600	620
PAYLOAD WITH DRIVER	800	800	800	800	800
PAYLOAD EXCLUDING DRIVER	725	725	725	725	725
MAXIMUM PERMITTED LOAD					
FRONT AXLE	1090	1090	1120	1120	1120
REAR AXLE	1450	1310	1310	1310	1450
TOTAL	2200	2230	2270	2270	2310

Model	SWB 5 seat Tour				
Engine Type	1.4 Petrol	1.3CDTi	1.6CDTi	1.6CDTi Tecshift	2.0CDTi
EMPTY WEIGHT (STD. A)	1340	1370	1410	1410	1450
FRONT AXLE	760	810	840	840	880
REAR AXLE	580	560	570	570	570
PAYLOAD WITH DRIVER	600	600	600	600	600
PAYLOAD EXCLUDING DRIVER	525	525	525	525	525
MAXIMUM PERMITTED LOAD					
FRONT AXLE	1090	1075	1075	1075	1120
REAR AXLE	1140	1075	1075	1075	1140
TOTAL	1940	1970	2010	2010	2050

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Model	SWB 5 seat Tour, High roof			
Engine Type	1.4 Petrol	1.6CDTi	1.6CDTi Tecshift	2.0CDTi
EMPTY WEIGHT (STD. A)	1360	1430	1430	1470
FRONT AXLE	765	870	870	880
REAR AXLE	595	560	560	590
PAYLOAD WITH DRIVER	600	600	600	600
PAYLOAD EXCLUDING DRIVER	525	525	525	525
MAXIMUM PERMITTED LOAD				
FRONT AXLE	1090	1075	1075	1120
REAR AXLE	1140	1075	1075	1140
TOTAL	1960	2030	2030	2070

Model	SWB 7 seat Tour				
Engine Type	1.4 Petrol	1.3CDTi	1.6CDTi	1.6CDTi Tecshift	2.0CDTi
EMPTY WEIGHT (STD. A)	1370	1400	1430	1430	1480
FRONT AXLE	745	790	840	840	860
REAR AXLE	625	610	590	590	620
PAYLOAD WITH DRIVER	685	685	685	685	685
PAYLOAD EXCLUDING DRIVER	610	610	610	610	610
MAXIMUM PERMITTED LOAD					
FRONT AXLE	1090	1090	1090	1090	1120
REAR AXLE	1170	1150	1140	1140	1160
TOTAL	2055	2085	2115	2115	2165

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Model	SWB Flatbed			
Engine Type	1.4 Petrol	1.3CDTi	1.6CDTi	2.0CDTi
EMPTY WEIGHT (STD. A)	1170	1210	1250	1290
FRONT AXLE	775	820	860	900
REAR AXLE	395	390	390	390
MIN. WEIGHT AT THE REAR (Std. A) AFTER CONV.	535	505	500	505
PAYLOAD WITH DRIVER	990	1080	1080	1080
PAYLOAD EXCLUDING DRIVER	915	1005	1005	1005
MAXIMUM PERMITTED LOAD				
FRONT AXLE	1090	1090	1090	1120
REAR AXLE	1450	1450	1450	1450
TOTAL	2160	2290	2330	2370

Model	LWB Flatbed			
Engine Type	1.4 Petrol	1.3CDTi	1.6CDTi	2.0CDTi
EMPTY WEIGHT (STD. A)	1185	1225	1265	1305
FRONT AXLE	785	830	870	910
REAR AXLE	400	395	395	395
MIN. WEIGHT AT THE REAR (Std. A) AFTER CONV.	555	525	520	525
PAYLOAD WITH DRIVER	1015	1105	1105	1105
PAYLOAD EXCLUDING DRIVER	940	1030	1030	1030
MAXIMUM PERMITTED LOAD				
FRONT AXLE	1090	1090	1090	1120
REAR AXLE	1450	1450	1450	1450
TOTAL	2200	2330	2370	2410

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TOWING WEIGHT

All the limits in the following documents must be complied with.

Special attention will be paid to vehicles with the load concentrated on the rear overhang and vehicles with a short wheelbase and high centre of gravity.

When positioning the auxiliary components and superstructures, the correct distribution of the loads in a transverse direction must be ensured. A variation in the nominal load (50% of the load on the axle) of ±4% in relation to that allowed by the tyres is permitted for each wheel without adversely affecting the braking properties and stability of the vehicle whilst in motion.

NOTE: on versions where the overall total weight exceeds 3500 kg with a trailer (figures shown in **red**) a tachograph must be fitted at an authorised centre. Alternatively, the overall total weight must be restricted to 3500 kg.

[All weights that follow in kilograms, kg.]

Model	SWB Van				
Engine Type	1.4 Petrol	1.3CDTi	1.6CDTi	1.6CDTi Tecshift	2.0CDTi
TOWING WEIGHT					
BRAKED TRAILER	1000	1000	1300	1300	1500
UNBRAKED TRAILER	500	500	500	500	500
MAX. LOAD ON THE ROOF	100	100	100	100	100
MAX. LOAD ON THE BALL	60	60	60	60	60
TOTAL OVERALL WEIGHT	2990	3020	3360	3360	**3600**

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Model	SWB Van + Increased payload (OPT RQ6)				
Engine Type	1.4 Petrol	1.3CDTi	1.6CDTi	1.6CDTi Tecshift	2.0CDTi
TOWING WEIGHT					
BRAKED TRAILER	1000	1000	1300	1300	1500
UNBRAKED TRAILER	500	500	500	500	500
MAX. LOAD ON THE ROOF	100	100	100	100	100
MAX. LOAD ON THE BALL	60	60	60	60	60
TOTAL OVERALL WEIGHT	3160	3290	3630	3630	3870

Model	SWB Van, High roof			
Engine Type	1.4 Petrol	1.6CDTi	1.6CDTi Tecshift	2.0CDTi
TOWING WEIGHT				
BRAKED TRAILER	1000	1300	1300	1500
UNBRAKED TRAILER	500	500	500	500
MAX. LOAD ON THE ROOF	100	100	100	100
MAX. LOAD ON THE BALL	60	60	60	60
TOTAL OVERALL WEIGHT	3010	3380	3380	3620

Model	SWB Van, High roof + Increased payload (OPT RQ6)			
Engine Type	1.4 Petrol	1.6CDTi	1.6CDTi Tecshift	2.0CDTi
TOWING WEIGHT				
BRAKED TRAILER	1000	1300	1300	1500
UNBRAKED TRAILER	500	500	500	500
MAX. LOAD ON THE ROOF	100	100	100	100
MAX. LOAD ON THE BALL	60	60	60	60
TOTAL OVERALL WEIGHT	3180	3650	3650	3890

NOTE: Subject to errors and technical amendments. The electronic version of the Conversion Guidelines is the decisive source for the up-to-date data on Conversion Guidelines

COMBO

Model	LWB Van				
Engine Type	1.4 Petrol	1.3CDTi	1.6CDTi	1.6CDTi Tecshift	2.0CDTi
TOWING WEIGHT					
BRAKED TRAILER	1000	1000	1300	1300	1500
UNBRAKED TRAILER	500	500	500	500	500
MAX. LOAD ON THE ROOF	100	100	100	100	100
MAX. LOAD ON THE BALL	60	60	60	60	60
TOTAL OVERALL WEIGHT	3200	3330	3670	3670	3910

Model	SWB Tour N1				
Engine Type	1.4 Petrol	1.3CDTi	1.6CDTi	1.6CDTi Tecshift	2.0CDTi
TOWING WEIGHT					
BRAKED TRAILER	1000	1000	1300	1300	1500
UNBRAKED TRAILER	500	500	500	500	500
MAX. LOAD ON THE ROOF	100	100	100	100	100
MAX. LOAD ON THE BALL	60	60	60	60	60
TOTAL OVERALL WEIGHT	3060	3090	3430	3430	3670

Model	SWB Tour N1+ Reinforced suspension (OPT F87)				
Engine Type	1.4 Petrol	1.3CDTi	1.6CDTi	1.6CDTi Tecshift	2.0CDTi
TOWING WEIGHT					
BRAKED TRAILER	1000	1000	1300	1300	1500
UNBRAKED TRAILER	500	500	500	500	500
MAX. LOAD ON THE ROOF	100	100	100	100	100
MAX. LOAD ON THE BALL	60	60	60	60	60
TOTAL OVERALL WEIGHT	3160	3190	3530	3530	3770

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COMBO

Model	LWB Tour N1				
Engine Type	1.4 Petrol	1.3CDTi	1.6CDTi	1.6CDTi Tecshift	2.0CDTi
TOWING WEIGHT					
BRAKED TRAILER	1000	1000	1300	1300	1500
UNBRAKED TRAILER	500	500	500	500	500
MAX. LOAD ON THE ROOF	100	100	100	100	100
MAX. LOAD ON THE BALL	60	60	60	60	60
TOTAL OVERALL WEIGHT	3200	3230	3570	3570	3810

Model	SWB 5 seat Tour				
Engine Type	1.4 Petrol	1.3CDTi	1.6CDTi	1.6CDTi Tecshift	2.0CDTi
TOWING WEIGHT					
BRAKED TRAILER	1000	1000	1300	1300	1500
UNBRAKED TRAILER	500	500	500	500	500
MAX. LOAD ON THE ROOF	100	100	100	100	100
MAX. LOAD ON THE BALL	60	60	60	60	60
TOTAL OVERALL WEIGHT	2940	2970	3310	3310	3550

Model	SWB 5 seat Tour, High roof			
Engine Type	1.4 Petrol	1.6CDTi	1.6CDTi Tecshift	2.0CDTi
TOWING WEIGHT				
BRAKED TRAILER	1000	1300	1300	1500
UNBRAKED TRAILER	500	500	500	500
MAX. LOAD ON THE ROOF	100	100	100	100
MAX. LOAD ON THE BALL	60	60	60	60
TOTAL OVERALL WEIGHT	2960	3330	3330	3570

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COMBO

Model	SWB 7 seat Tour				
Engine Type	1.4 Petrol	1.3CDTi	1.6CDTi	1.6CDTi Tecshift	2.0CDTi
TOWING WEIGHT					
BRAKED TRAILER	1000	1000	1300	1300	1500
UNBRAKED TRAILER	500	500	500	500	500
MAX. LOAD ON THE ROOF	100	100	100	100	100
MAX. LOAD ON THE BALL	60	60	60	60	60
TOTAL OVERALL WEIGHT	3055	3085	3115	3115	3665

Model	SWB Flatbed			
Engine Type	1.4 Petrol	1.3CDTi	1.6CDTi	2.0CDTi
TOWING WEIGHT				
BRAKED TRAILER	1000	1000	1300	1500
UNBRAKED TRAILER	500	500	500	500
MAX. LOAD ON THE ROOF	0	0	0	0
MAX. LOAD ON THE BALL	60	60	60	60
TOTAL OVERALL WEIGHT	3160	3290	3630	3870

Model	LWB Flatbed			
Engine Type	1.4 Petrol	1.3CDTi	1.6CDTi	2.0CDTi
TOWING WEIGHT				
BRAKED TRAILER	1000	1000	1300	1500
UNBRAKED TRAILER	500	500	500	500
MAX. LOAD ON THE ROOF	0	0	0	0
MAX. LOAD ON THE BALL	60	60	60	60
TOTAL OVERALL WEIGHT	3200	3630	3670	3910

NOTE: Subject to errors and technical amendments. The electronic version of the Conversion Guidelines is the decisive source for the up-to-date data on Conversion Guidelines

The rear overhang of the superstructure should comply with the maximum permitted loads on the axle, the minimum load on the front axle, the length limits, the positioning of the tow hook and the underrun protection bar, set out in the various regulations.

Special exemptions for the maximum permitted weights may be issued for particular uses. However, precise restrictions as to the usage and any reinforcements to be made to the vehicle components will need to be established.

If they exceed the legal limits, these exemptions should be authorised by the appropriate administrative bodies.

NOTE: To avoid irregular geometry with the vehicle in running order (after the conversion) the difference in weight between the left and right sides should not exceed 100 kg.

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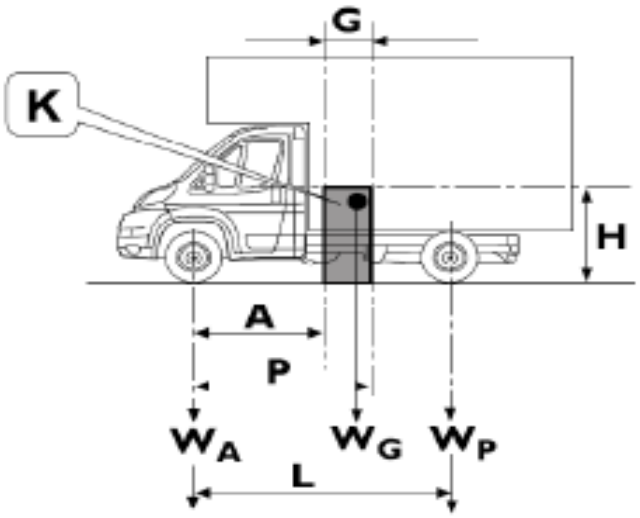
COMBO

CENTRE OF GRAVITY

The value of the height from the ground of the vehicle's centre of gravity before conversion is given in the specific technical documentation for each model/version.

During the test, the outfitter should check that figures for the centre of gravity of the fitted out version (including the payload) or the entire vehicle fully laden, comply with the maximum permitted values.

These limits are defined to comply with the national or international standards (e.g. EC directives on braking) or are prescribed to ensure the correct dynamic behaviour of the vehicle (e.g. transverse stability in motion).



K = Position area of centre of gravity G in all fitted out vehicle load conditions
L = Vehicle wheelbase
C_M = Track (maximum between the FRONT and REAR)
W_G = Total maximum weight on the ground
W_A = Front axle max. permitted weight
W_P = Rear axle max. permitted weight
A = $(W_G - W_A)*L/W_G$ (minimum distance from front axle)
P = $L* W_P/ W_G$ (maximum distance from front axle)
G = P – A (longitudinal range of G)
H = $0.7*C_M$ (vertical range of G)

NOTE: Subject to errors and technical amendments. The electronic version of the Conversion Guidelines is the decisive source for the up-to-date data on Conversion Guidelines

On conversions where the payload can move sideways (e.g. hanging loads, transportation of liquids, etc.), higher dynamic transverse forces may be produced, especially when cornering, resulting in less stability of the vehicle. For this reason the usage of the vehicle must be taken into account in case any reduction to the height of the centre of gravity is needed.

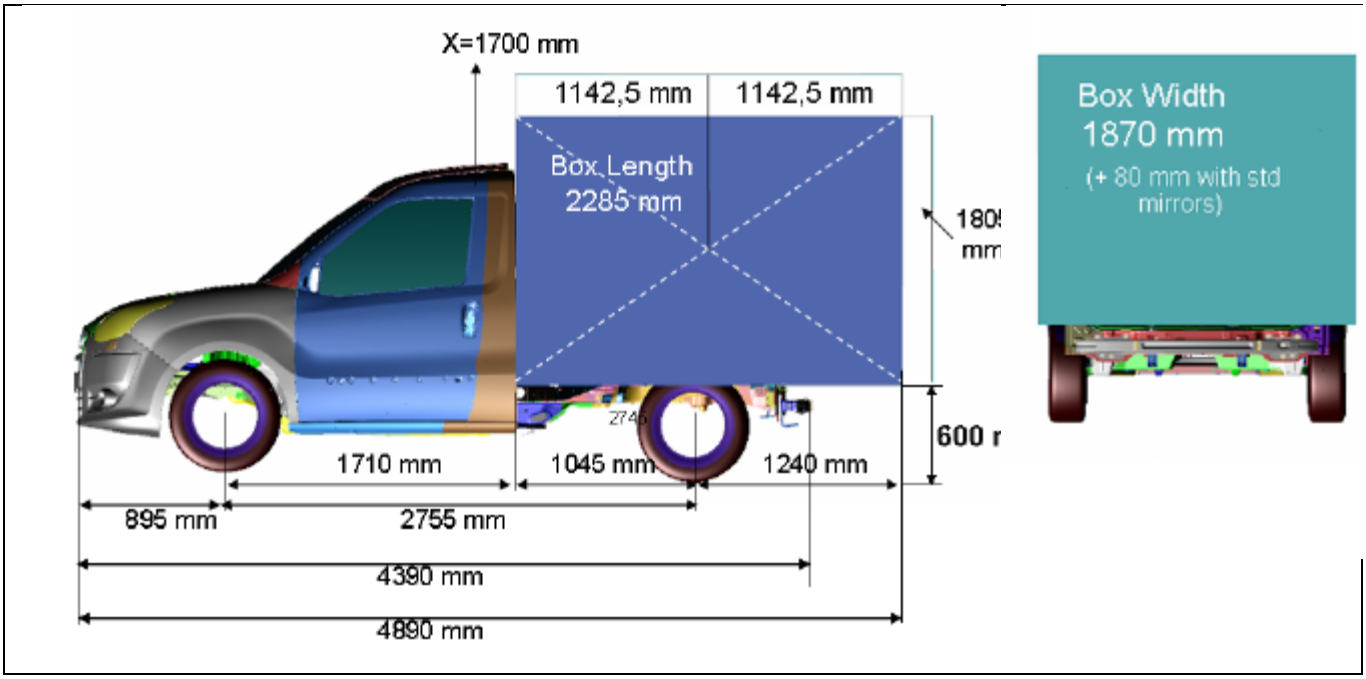
The maximum permitted limits for the weights (total and on the individual axles) must be complied with bearing in mind the number of persons transported and also allowing a sufficient margin for the loads transported.

NOTE: Subject to errors and technical amendments. The electronic version of the Conversion Guidelines is the decisive source for the up-to-date data on Conversion Guidelines

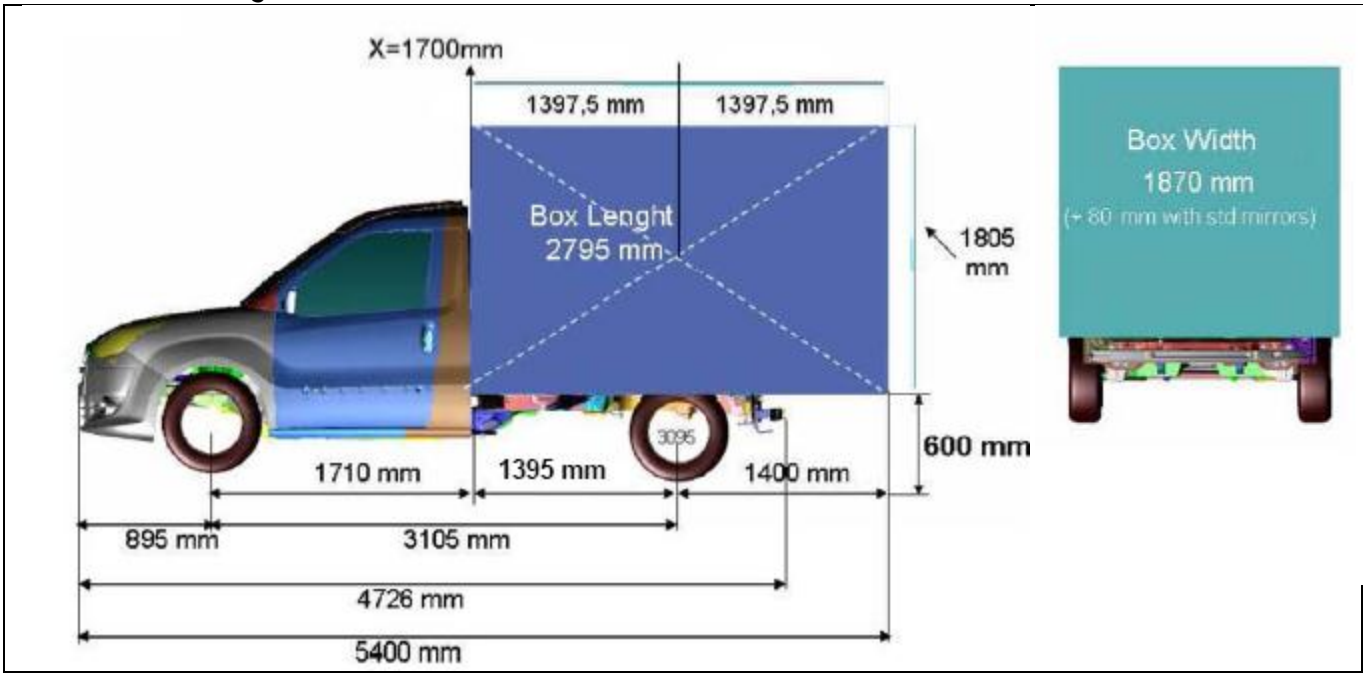
COMBO

SHAPE LIMITS

Conversion on Short wheelbase flatbed



Conversion on Long wheelbase flatbed



NOTE: Subject to errors and technical amendments. The electronic version of the Conversion Guidelines is the decisive source for the up-to-date data on Conversion Guidelines

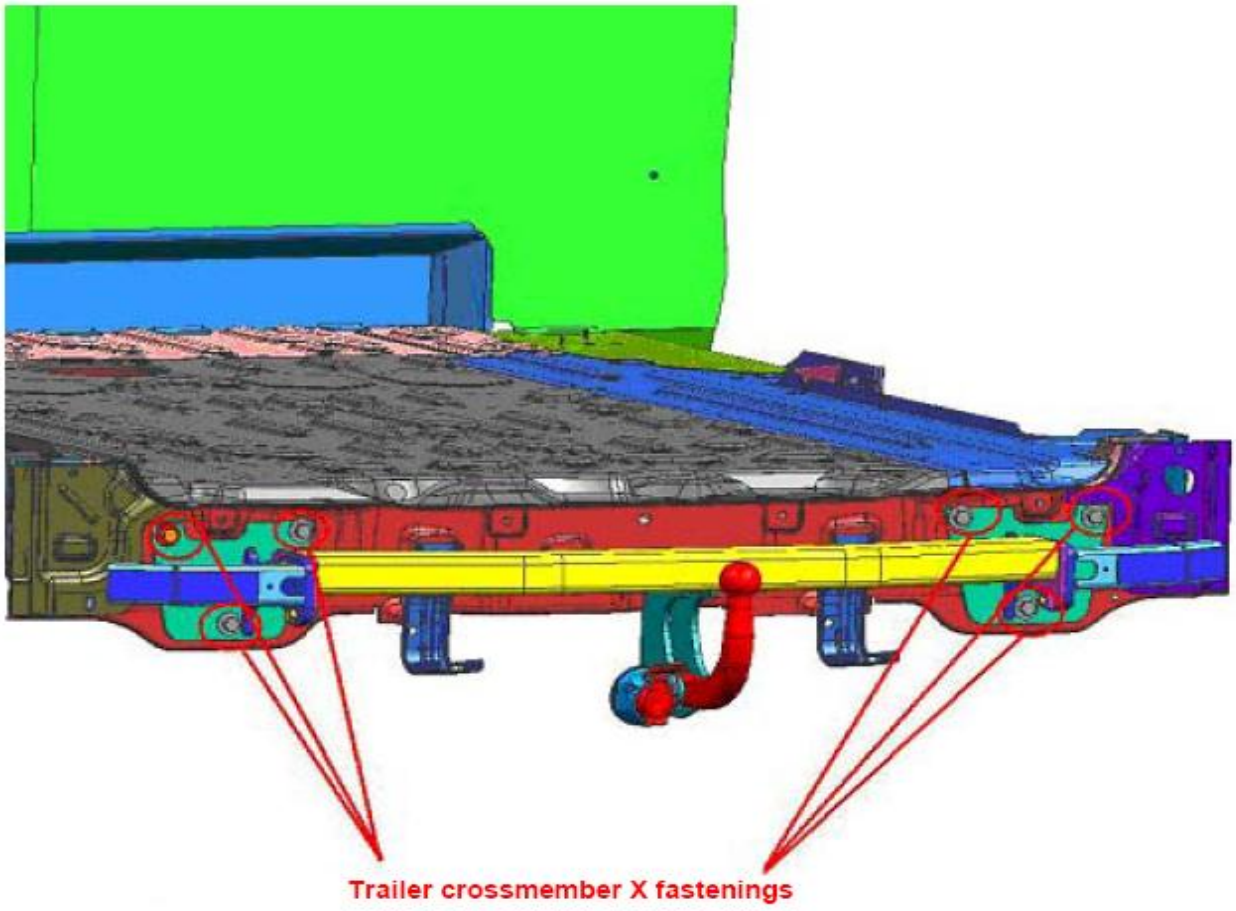
COMBO

TOW HOOK

A tow hook can only be fitted, without asking for permission from the manufacturer, on cross members that are designed for that purpose and only on vehicles designed to fit trailers to.

Note: As tow hooks are important elements in driving safety the limits laid down by the laws in force should be observed, namely the minimum spaces for the coupling for the brakes and the electrical equipment, the maximum distance between the axles, the hook pin and the rear edge of the superstructure.

If the dimensions of the hook attachment flange do not correspond with the existing drillings in the vehicle rear cross-member, the modification can be authorised subject to suitable reinforcements being fitted.
The fastening points for the trailer cross-member for axis X are illustrated in the diagram below.



Trailer crossmember X fastenings

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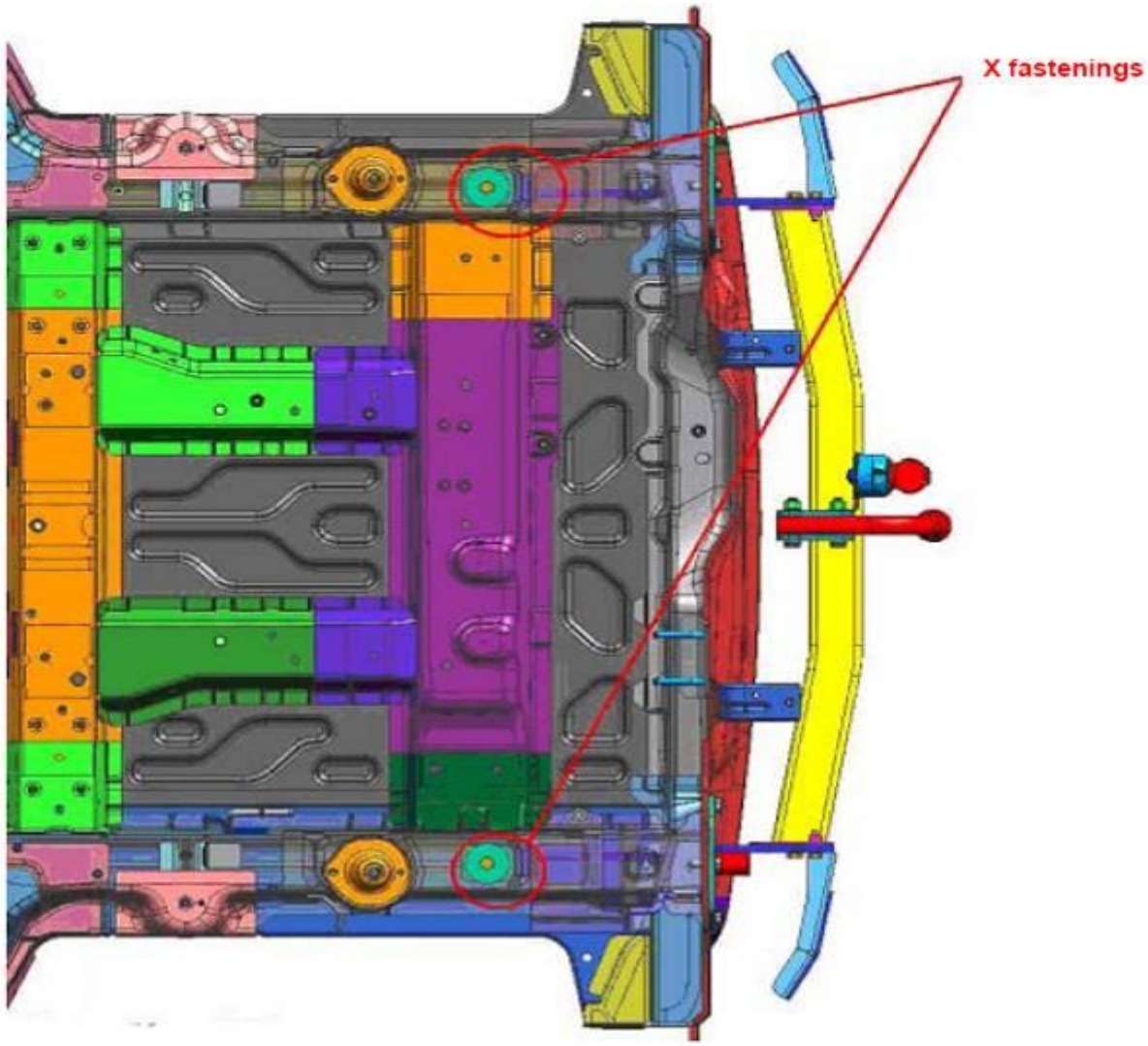
COMBO

The fastening points for the trailer cross-member for axis X are illustrated in the diagram below.



The use of tow kits, certified by the manufacturer and available from the vehicle accessories catalogue, is recommended.

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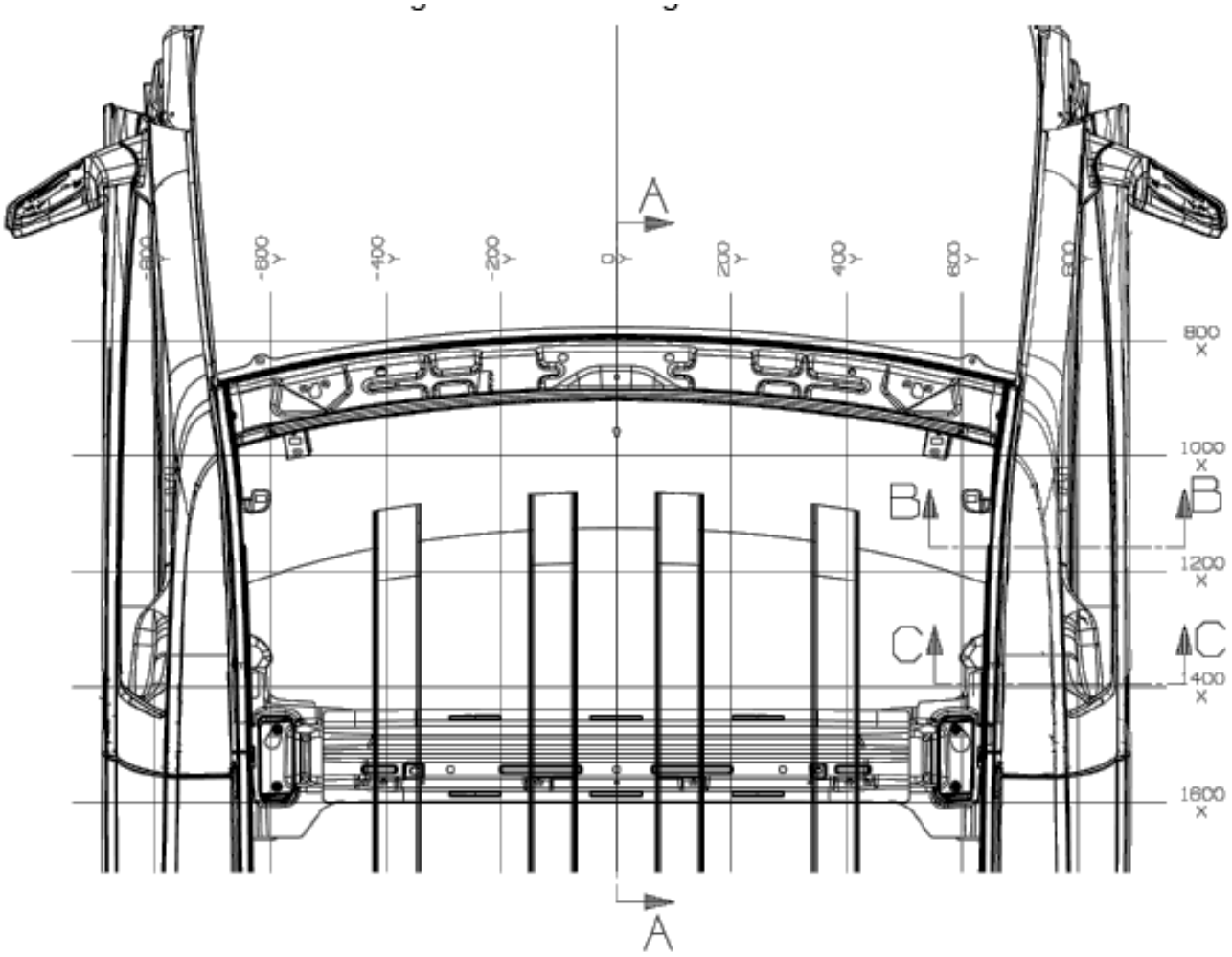
COMBO

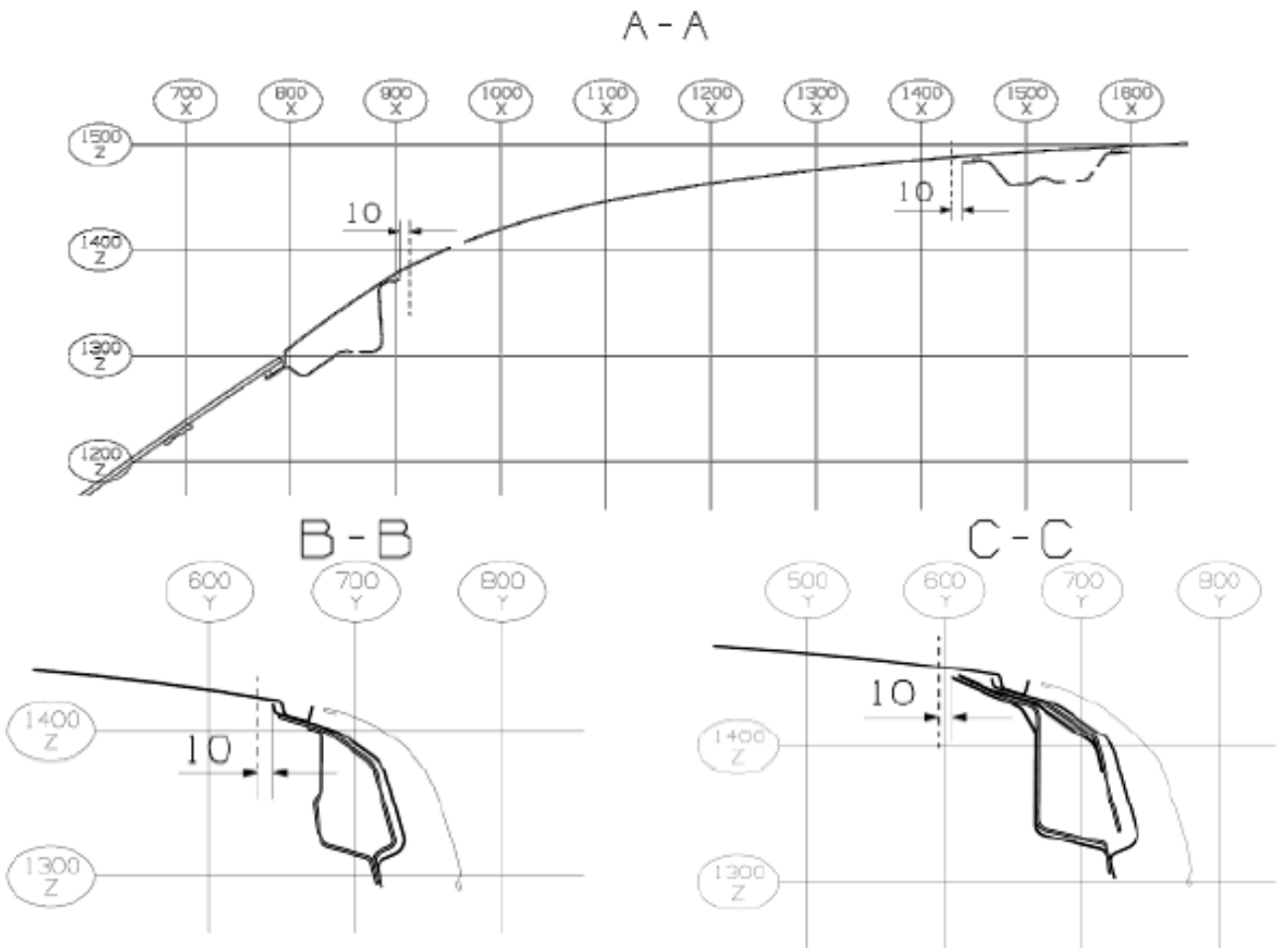
MODIFICATIONS TO THE ROOF

Arrangements for cutting the roof.

The roof can be cut following the instructions given below for H1 variants:



NOTE: Subject to errors and technical amendments. The electronic version of the Conversion Guidelines is the decisive source for the up-to-date data on Conversion Guidelines



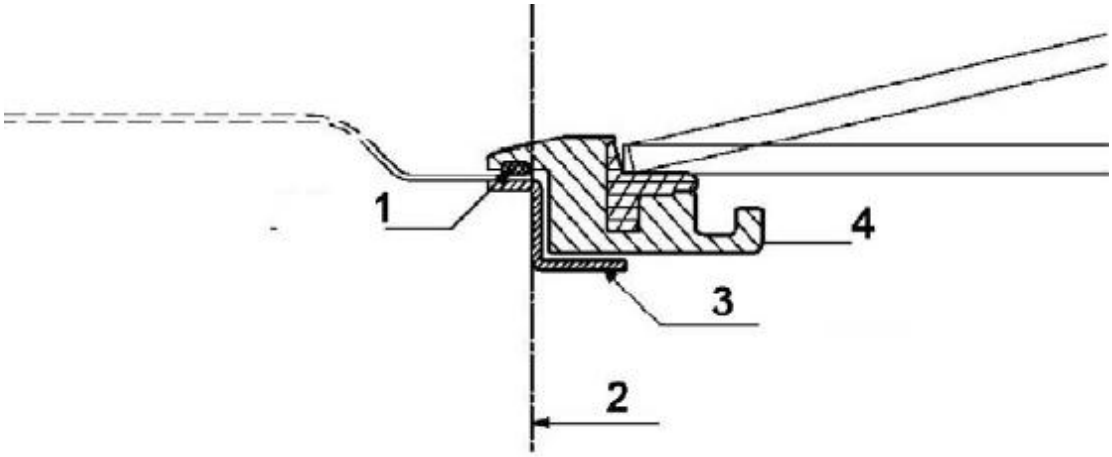
All conversions which require a modification to the cab roof must include precise instructions and measurements in order to maintain the structural rigidity and functionality of the cab. Care must also be taken to maintain the integrity of the seat belt mountings (see detail A).

NOTE: Subject to errors and technical amendments. The electronic version of the Conversion Guidelines is the decisive source for the up-to-date data on Conversion Guidelines

COMBO

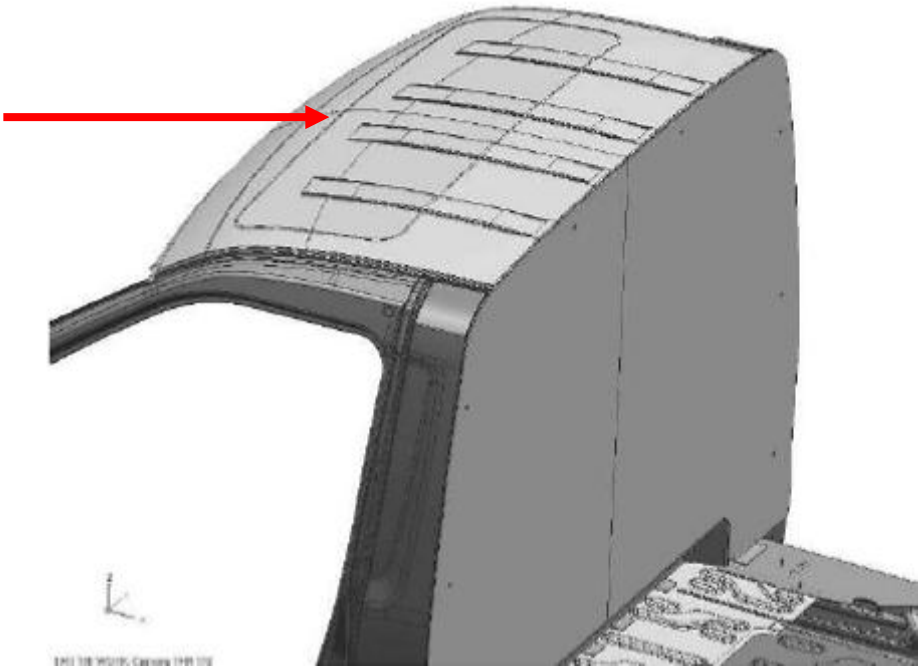
ROOF HATCH

A roof hatch can be fitted in the cab roof, on condition that the hatch is completely sealed.
An example of such an installation is illustrated below.



- 1 Sealant
- 2 Cutting area
- 3 Mounting profile
- 4 Hatch

Example of fitting – standard hatch measurements



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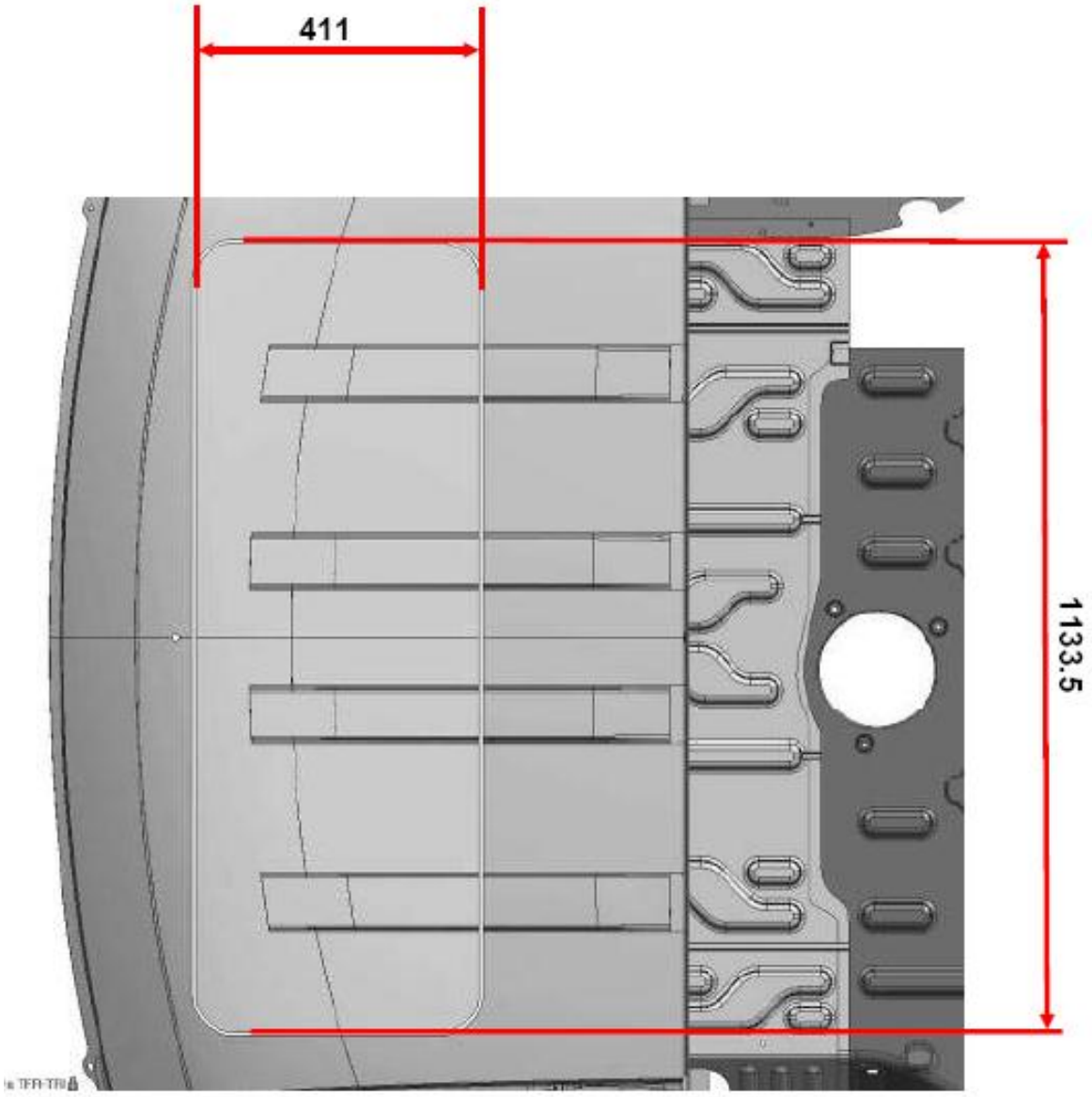
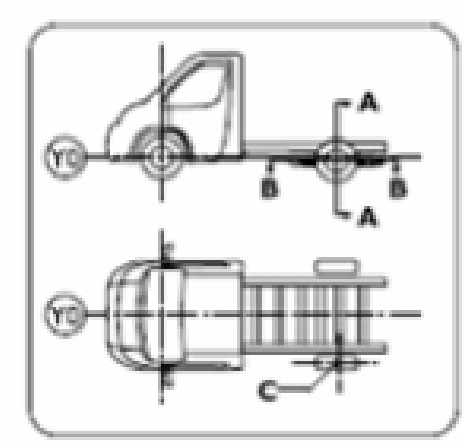


NOTE: Subject to errors and technical amendments. The electronic version of the Conversion Guidelines is the decisive source for the up-to-date data on Conversion Guidelines

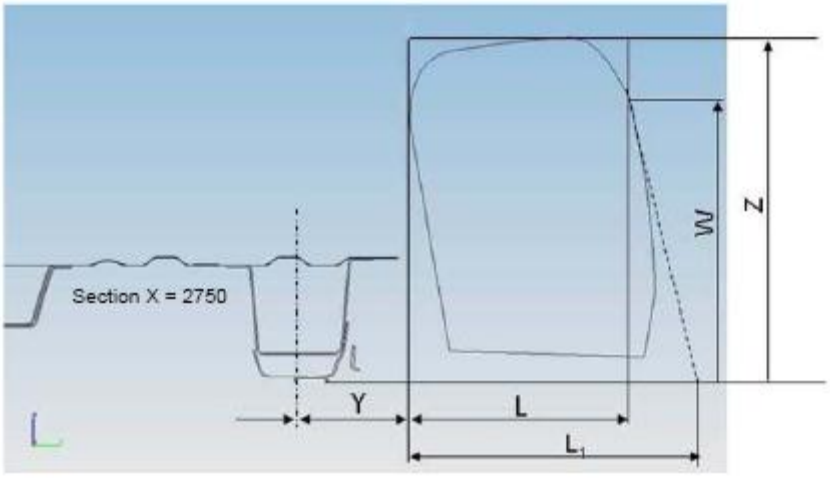
COMBO

WHEEL ARCH DIMENSIONS

The diagrams below show the maximum travel of the wheel during vehicle use. All modifications must allow for this movement.



Section A-A:

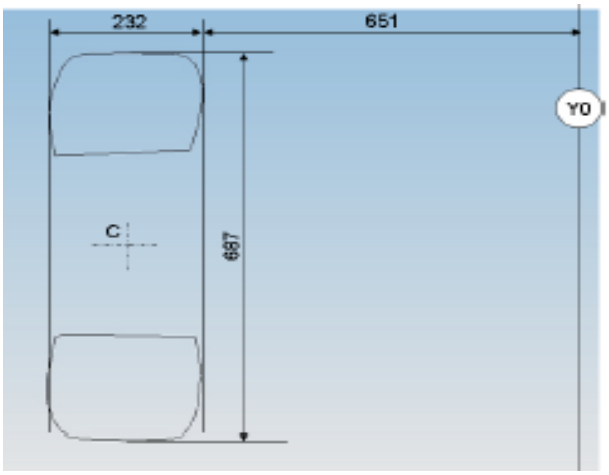


Tyres	Y	L	L_1	W	Z
195/65 R16	120	225	255	310	360
195/65 R15	120	225	255	275	360
185/65 R15	120	225	255	275	360

NOTE: Subject to errors and technical amendments. The electronic version of the Conversion Guidelines is the decisive source for the up-to-date data on Conversion Guidelines

COMBO

Section B-B:



NOTE: The figures in the diagram include a maximum clearance of 10mm in relation to the tyre (without chains), the asymmetric shaking of the suspension and maximum buffering.

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COMBO

SUSPENSION AND WHEELS

The following wheel geometries must be checked and maintained by the converter following any conversion, before the vehicle is delivered to the customer.

FRONT:

Camber:

Engine Types	Version	Type	Std 0	Std A
All versions	All versions	All versions	-20' (+/- 20')	-40' (+/- 20')

Caster

Engine Types	Version	Type	Std 0	Std A
All versions	All versions	All versions	2° 55'	2° 55'

Toe in

Tolerance +/- 1 mm for 15'' wheels and +/- 1.1 mm for 16'' wheels measured at the outer edge of the rim as the difference (d2-d1 mm)

Engine Types	Version	Type	Std 0	Std A
All versions	All versions	All versions	-0.5 (+/- 1)mm	-0.5 (+/- 1)mm

REAR:

Camber

Engine Types	Version	Type	Std 0	Std A
All versions	All versions	All versions	11' +/- 31'	10' +/- 31'

Toe in

Engine Types	Version	Type	Std 0	Std A
All versions	All versions	All versions	3.5 (+/- 1)mm	3.5 (+/- 1)mm

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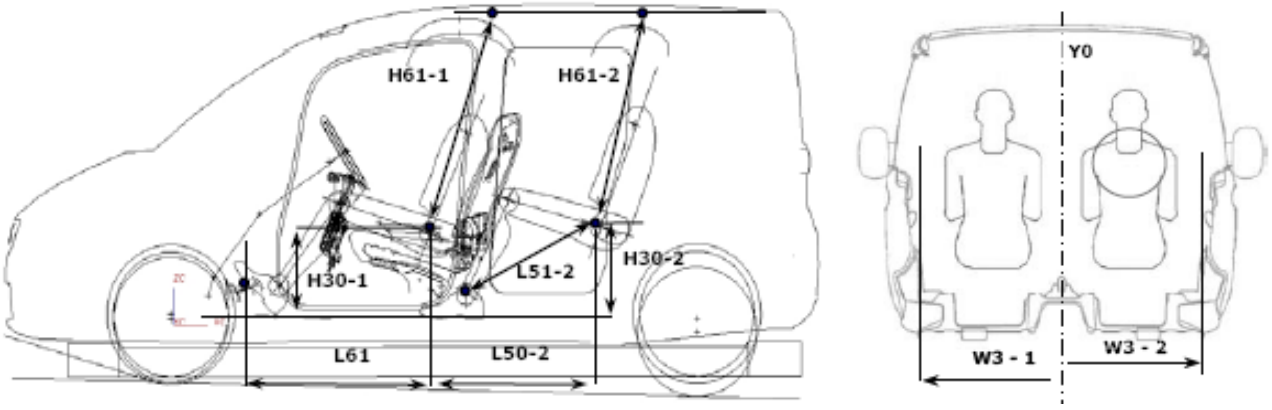
COMBO

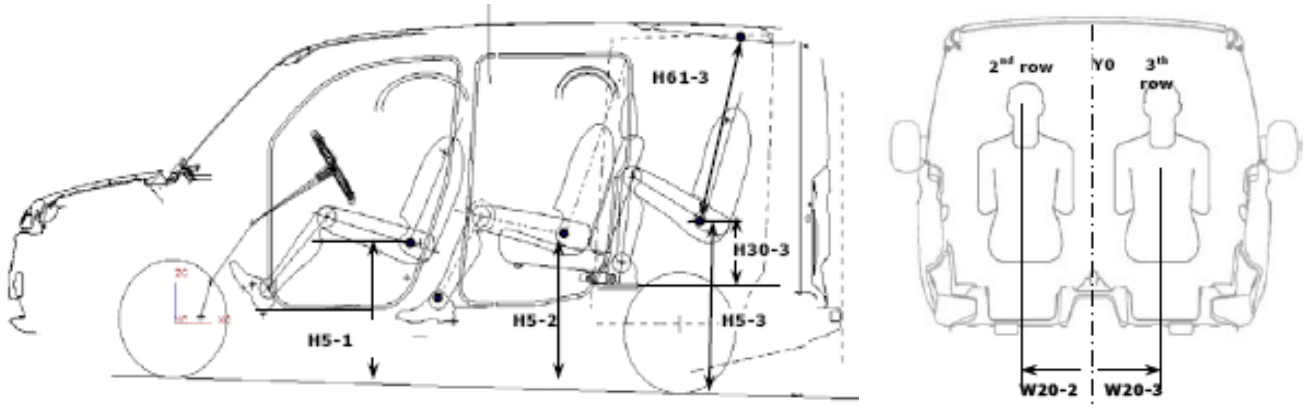
INTERIOR HABITABILITY DIAGRAMS

Interior dimensions for Van and Tour versions.



	L61	H30-1	H61-1	W3-1	L50-2	L51-2	H30-2	H61-2	W3-2
Combo Van	900	345	1165	1504	N/A	N/A	N/A	N/A	N/A
Combo Tour	900	345	1173	1504	820	969	400	1138	1510

Interior dimensions for 7 seat Tour versions.



	H5-1	W20-1	H5-2	W20-2	H5-3	W20-3	L50-3	H30-3	H61-3
Combo Tour 5 seat	688	330	762	420	N/A	N/A	N/A	N/A	N/A
Combo Tour 7 seat	688	330	762	420	869	350	750	308	1008

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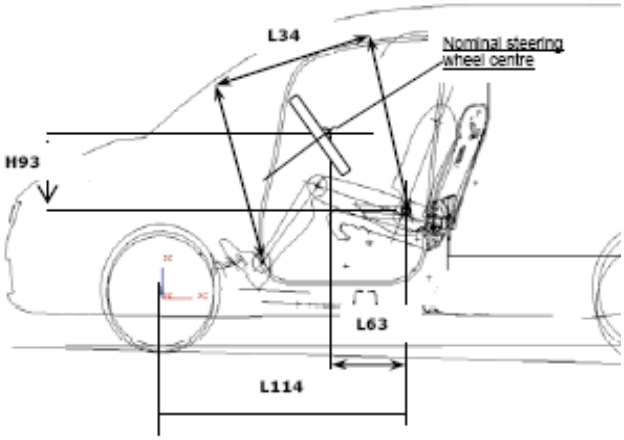
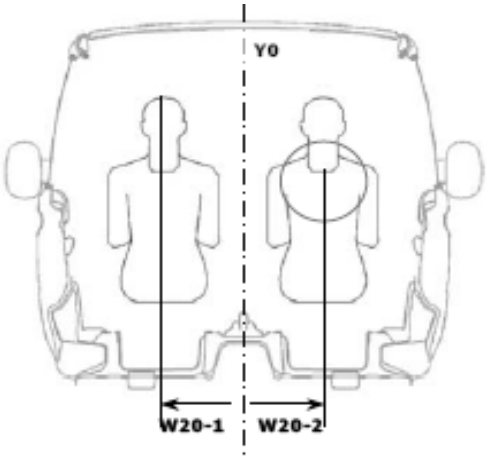
COMBO

Interior dimensions for Van and Tour versions.





	L114	L34	L63	H93	W20-1	W20-2
Combo Van	1283	1043	404	366	330	330

Load compartment interior dimensions for Van versions.

	SWB	LWB
LOAD COMPARTMENT DIMENSIONS		
LENGTH, mm	1820 / 3050**	2170 / 3400**
MAX WIDTH, mm	1714	1714
WIDTH BETWEEN WHEEL ARCHES, mm	1230	1230
HEIGHT, mm	1305 / 1550*	1305
HEIGHT FROM GROUND, mm	545	545
CARRYING VOLUME, m^3	3.4-3.8** / 4.0-4.4* **	4.2-4.6**
DOOR DIMENSIONS		
SIDE DOOR WIDTH, mm	700	700
SIDE DOOR HEIGHT, mm	1175	1175
REAR DOOR WIDTH, mm	1231	1231
REAR DOOR HEIGHT, mm	1250 / 1455*	1250
WEIGHTS		
PAYLOAD INCL. DRIVER, kg	750 - 1000	1000

* = HIGH ROOF

** = WITH PASSENGER SEAT FOLDED DOWN

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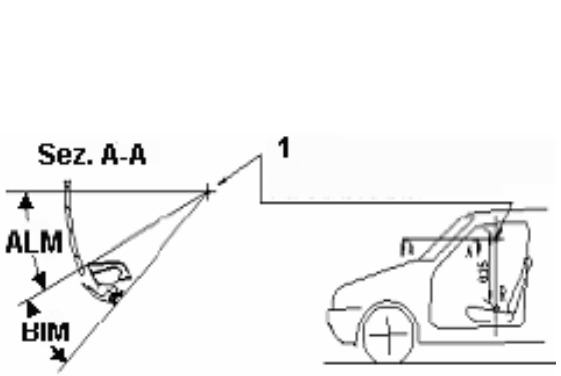
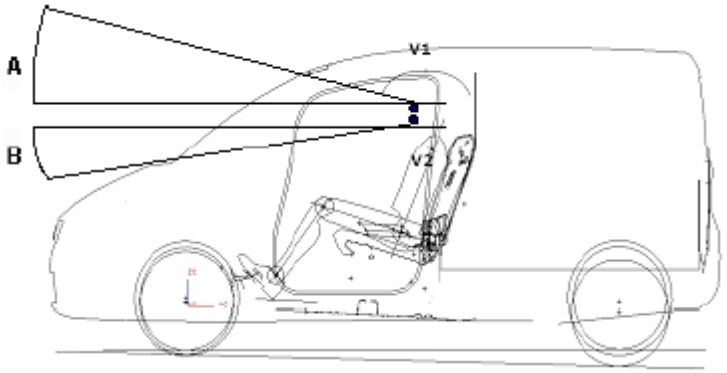
COMBO

EXTERIOR VISIBILITY

Front

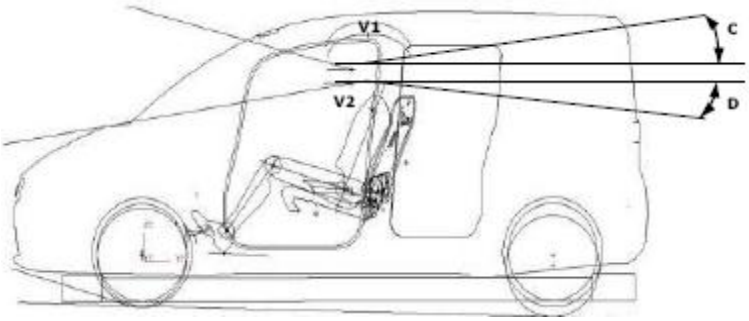


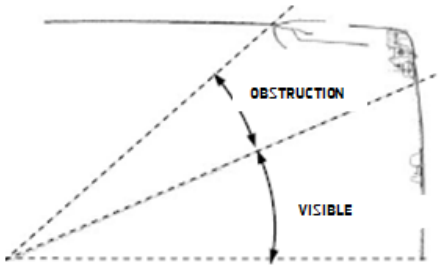


Ocular points centre line (X-Y plane)

	ALM	BIM	A	B
Combo	25.6°	11.2°	21.3°	7.7°

Rear





	Swing door		Tailgate		Pillar C	
	C	D	C	D	Visible	Obstruction
Combo	7.7°	3.6°	7.8°	3.9°	23.9°	11°

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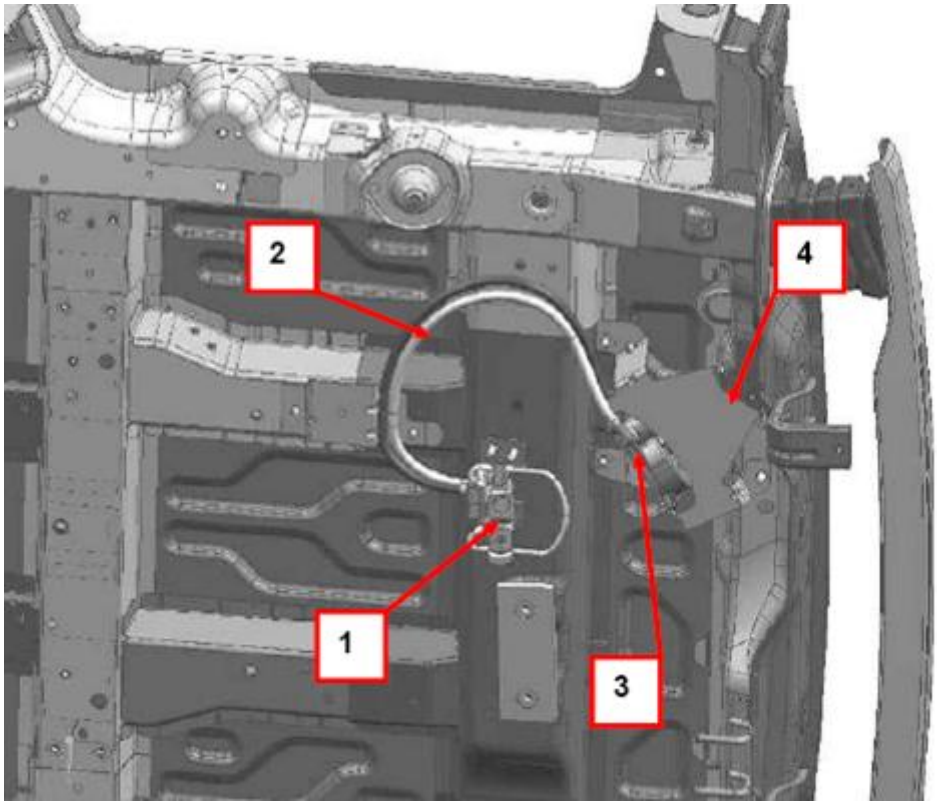
COMBO

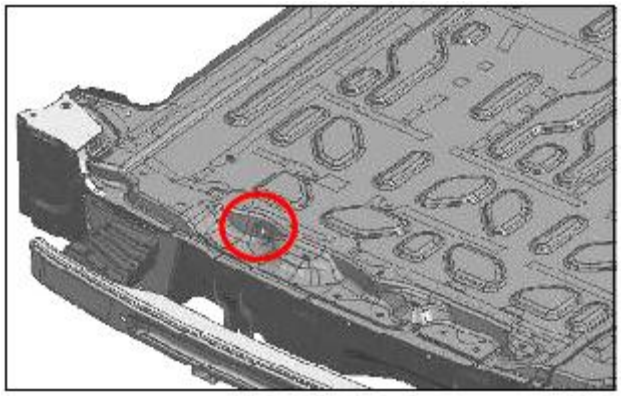
SPARE WHEEL

The spare wheel may be located at the rear of the vehicle, in the outer housing under the frame.
The complete device is fastened to the chassis:

- In the middle through the wheel raising/lowering cylinder (1),
- At the back by the control (3) complete with cables (2) and mounting brackets (4).



If a spare wheel is already fitted, ensure the opening for lowering the spare wheel is still accessible.



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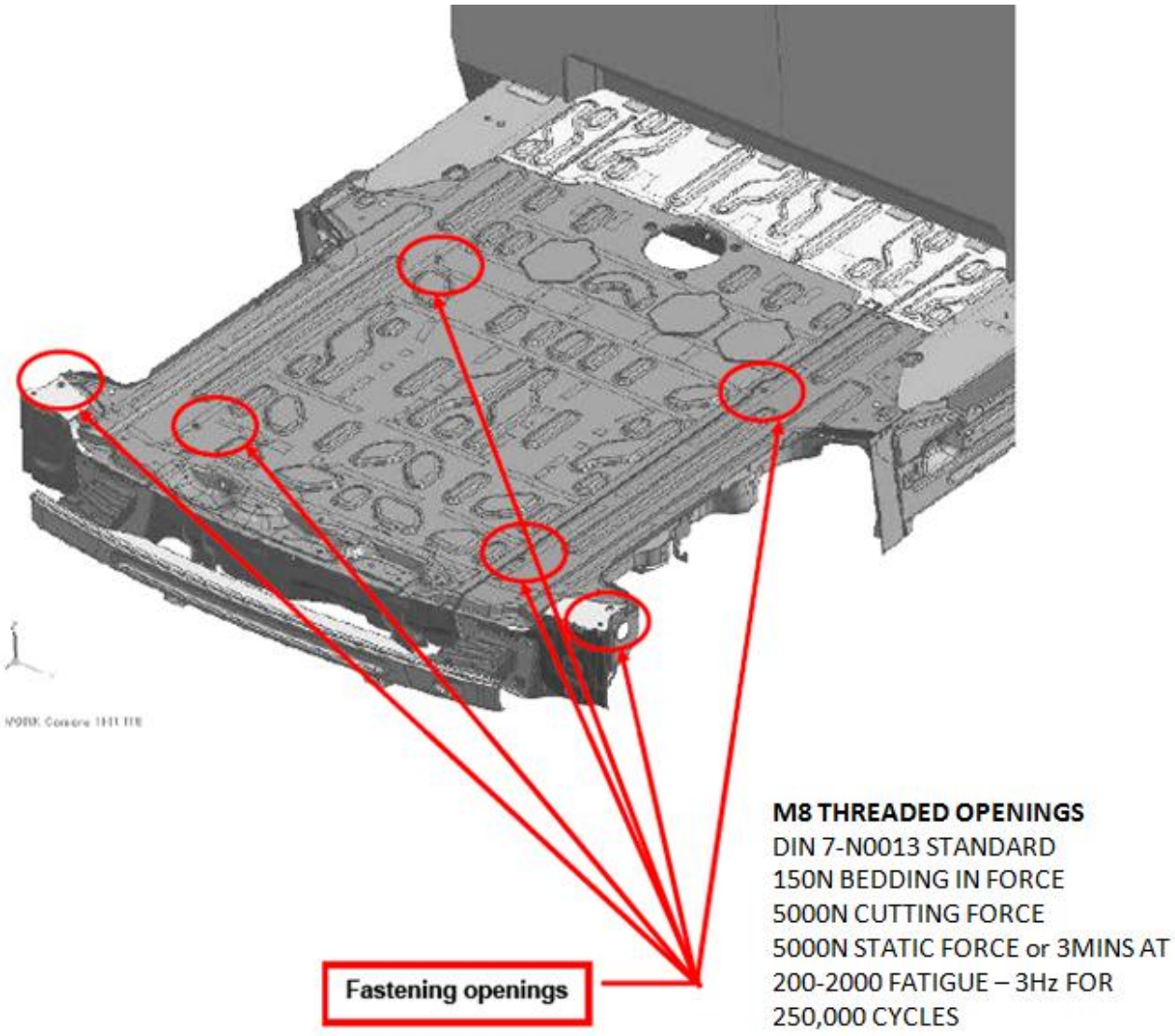
COMBO

INSTRUCTIONS FOR CONNECTING SUPERSTRUCTURES

Drilling the frame

The existing openings (illustrated) should, in the main, be used in order to fit auxiliary units and components to the frame or the body.

If new openings have to be made, they should be made in the rear floor and carefully deburred, reamed and covered with a suitable corrosion protection. The new openings should not be made near the areas most subjected to stress, namely: areas supporting springs, shock absorbers, brackets and cross member mountings.



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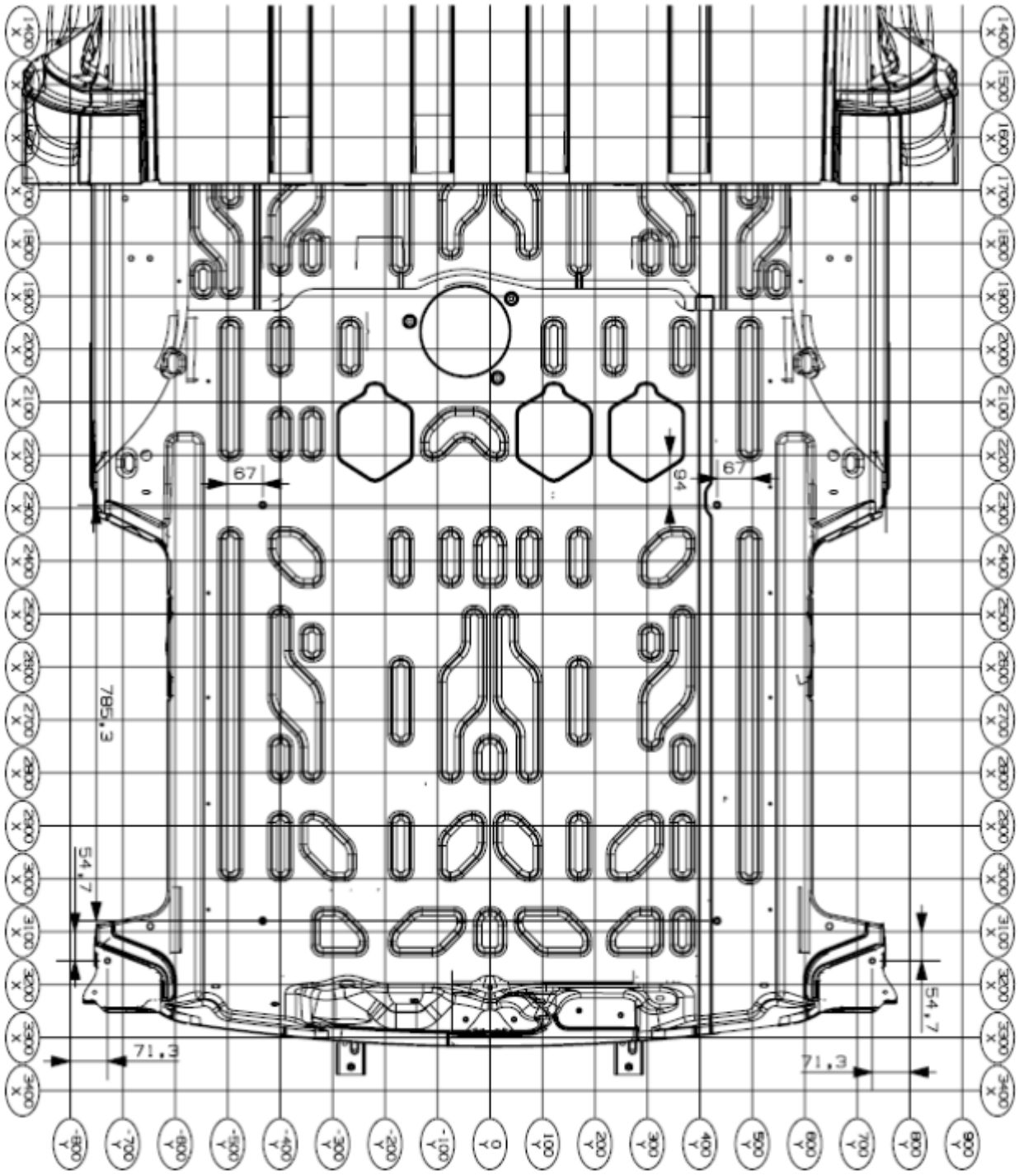
COMBO

Position of openings in the floor on Short wheelbase version



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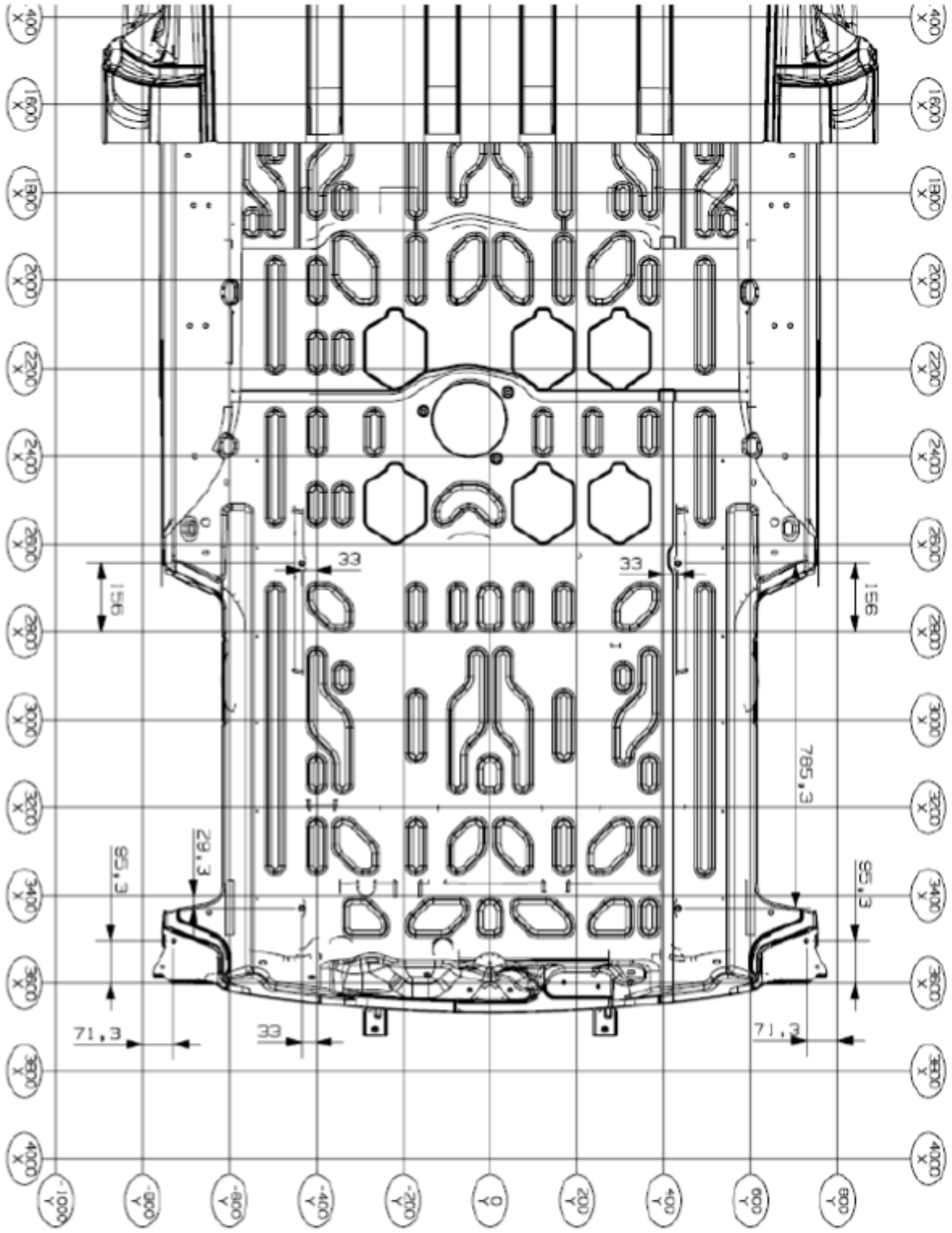
COMBO

Position of openings in the floor on Long wheelbase version



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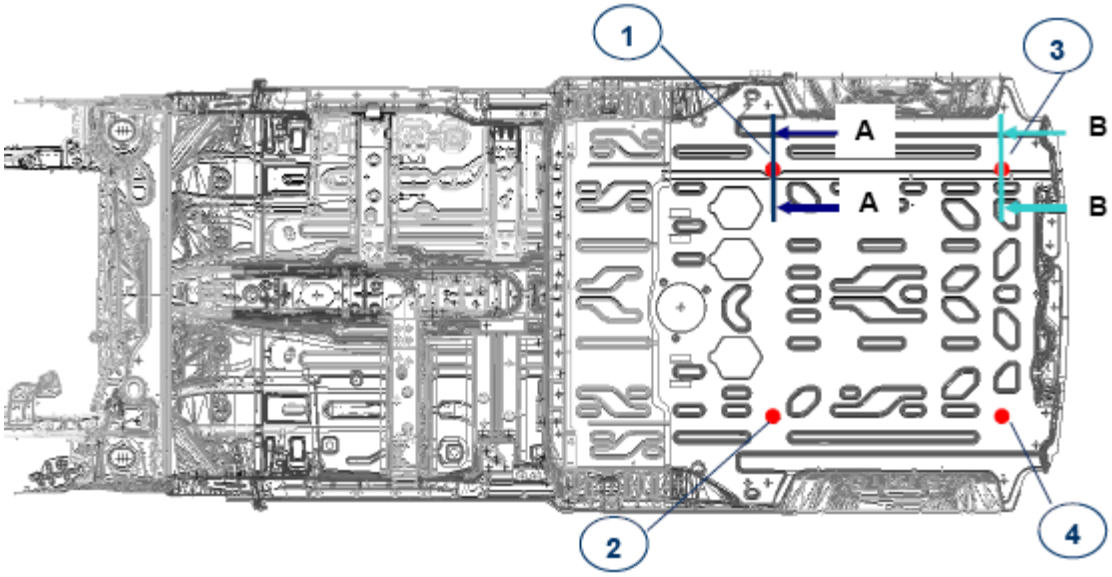
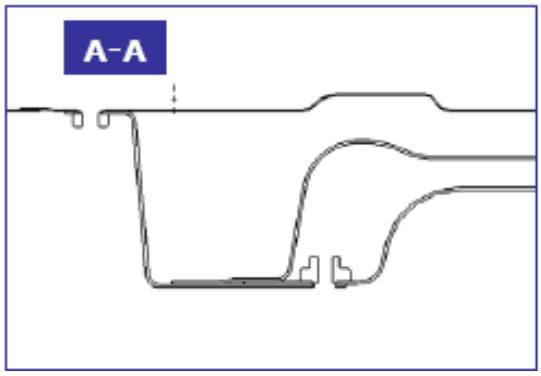
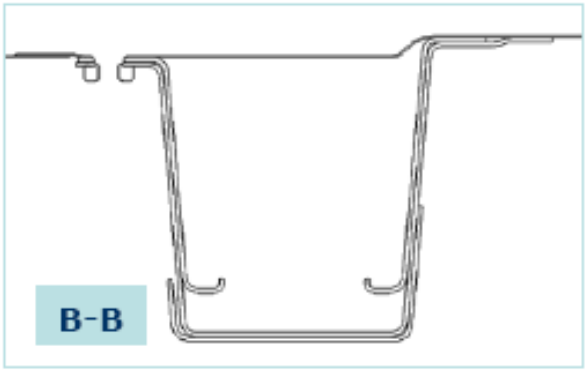
COMBO

Cross sections of fastening openings/load retaining seals in the floor.

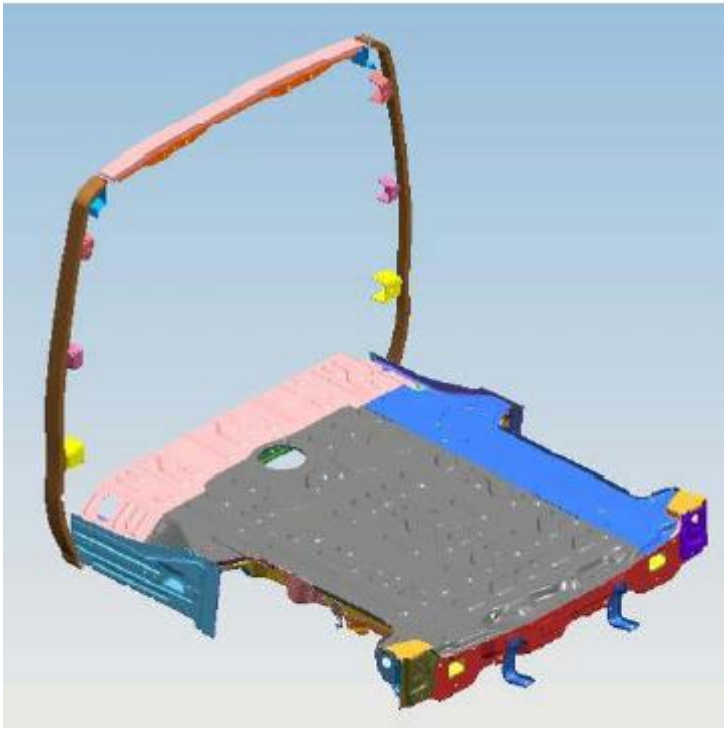


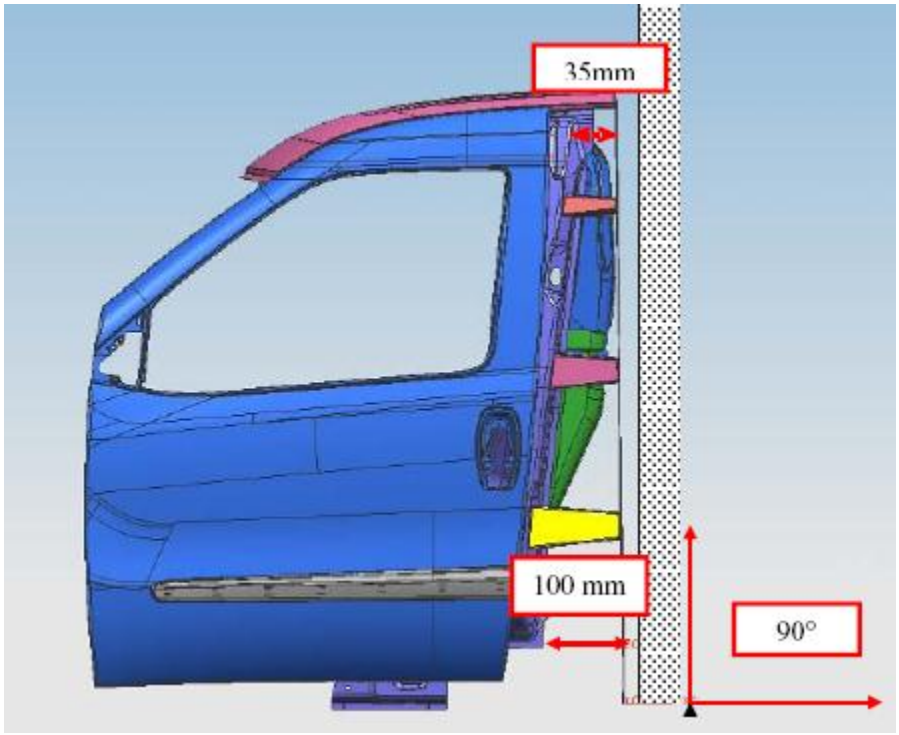




NOTE: Subject to errors and technical amendments. The electronic version of the Conversion Guidelines is the decisive source for the up-to-date data on Conversion Guidelines

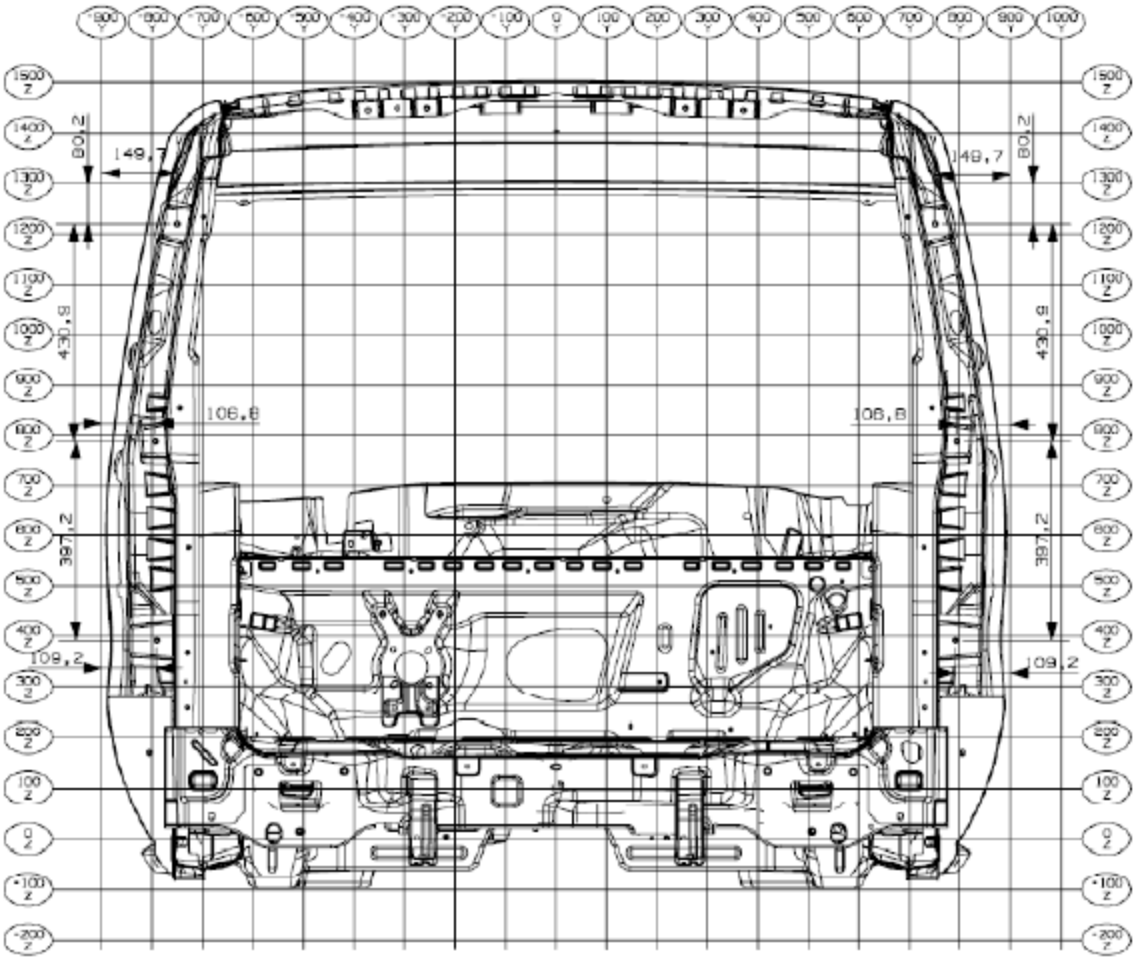
COMBO
INTERFACE WITH REAR OF CAB

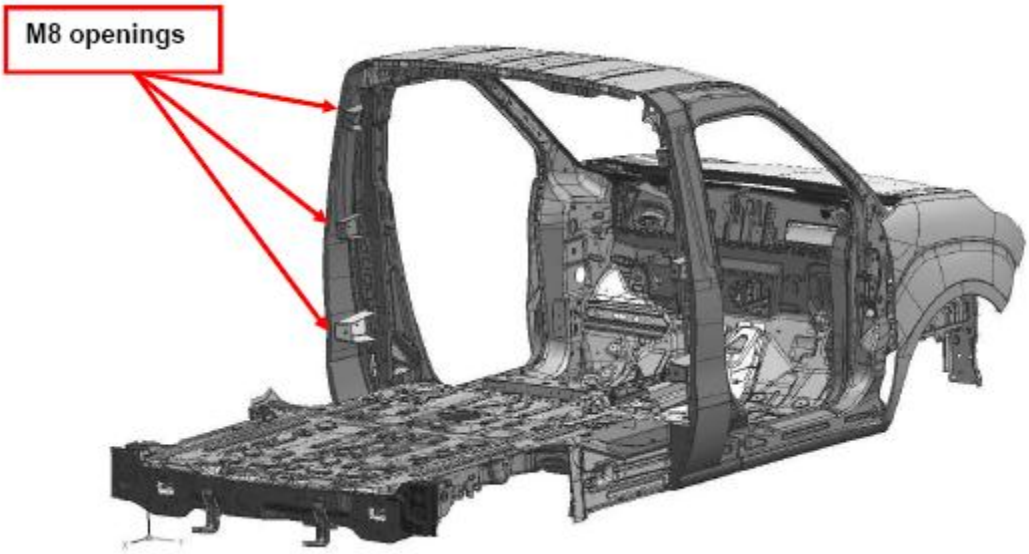




NOTE: Subject to errors and technical amendments. The electronic version of the Conversion Guidelines is the decisive source for the up-to-date data on Conversion Guidelines

COMBO





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COMBO

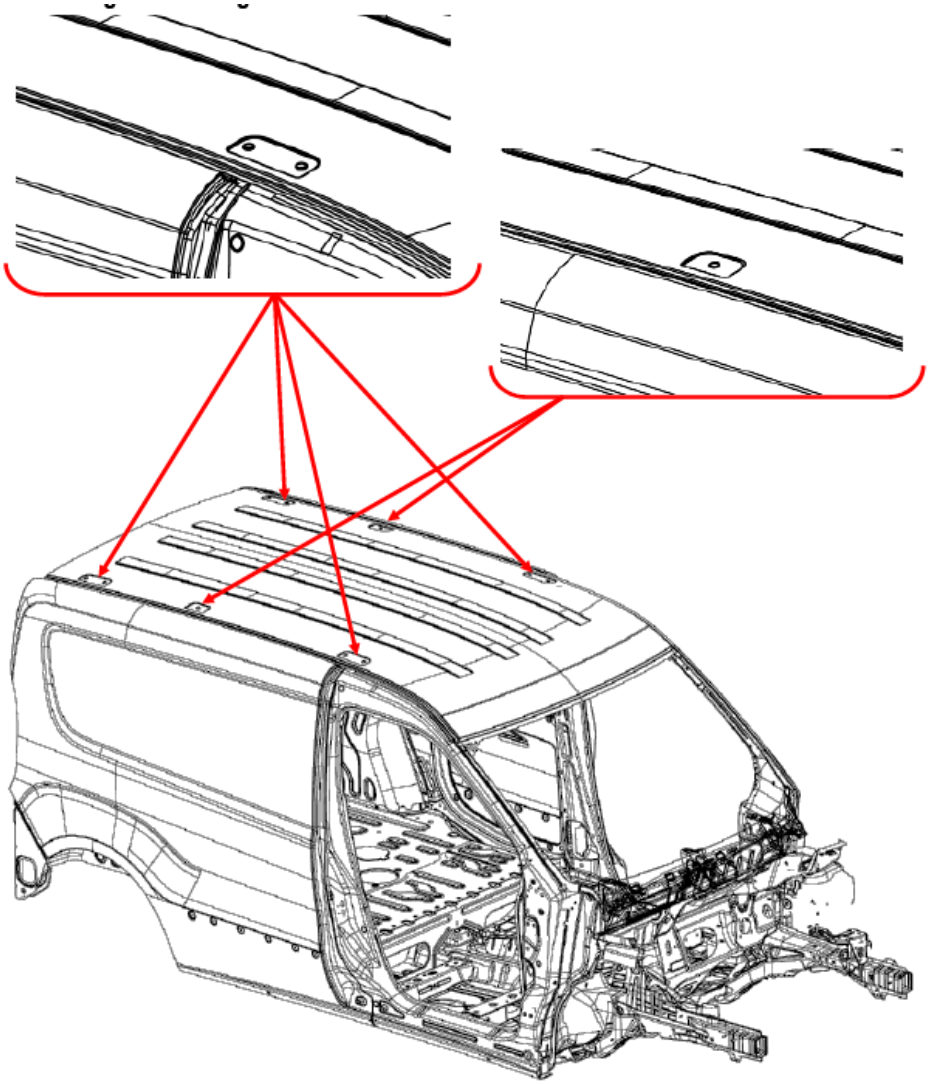
ROOF RACKS

Parcel racks should be fitted using the fastenings on the roof, following the instructions of the manufacturer of the parcel rack. The maximum permitted load, including the parcel rack, must be complied with.

- Short wheelbase - 100 Kg
- Long wheelbase - 100 Kg

NOTE: The limit of 25 kg for each mounting on the roof should not be exceeded under any circumstances. The maximum permitted weight of 100 kg is also valid as an absolute limit if the wheelbase is extended.

Fastening Positions



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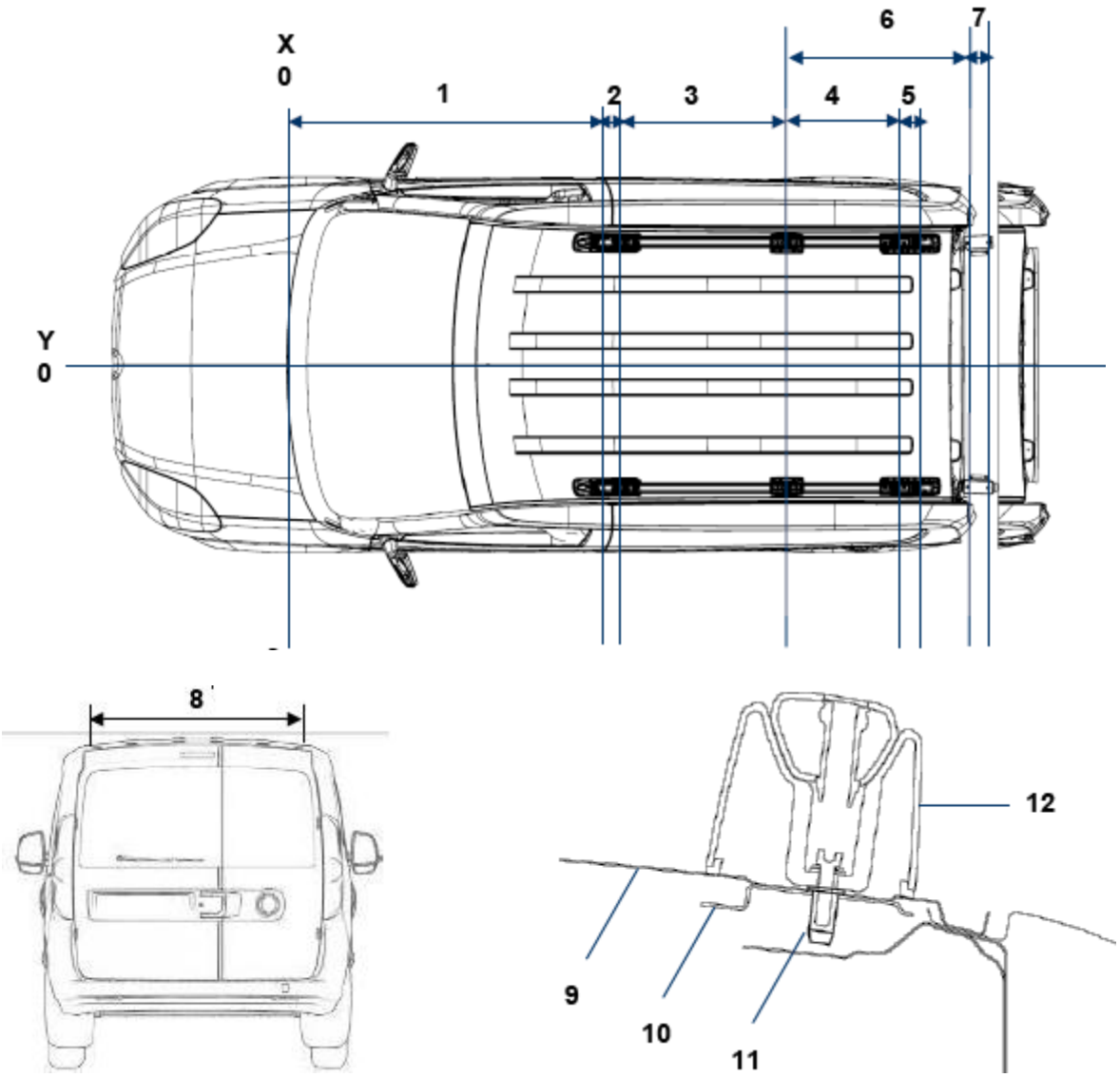


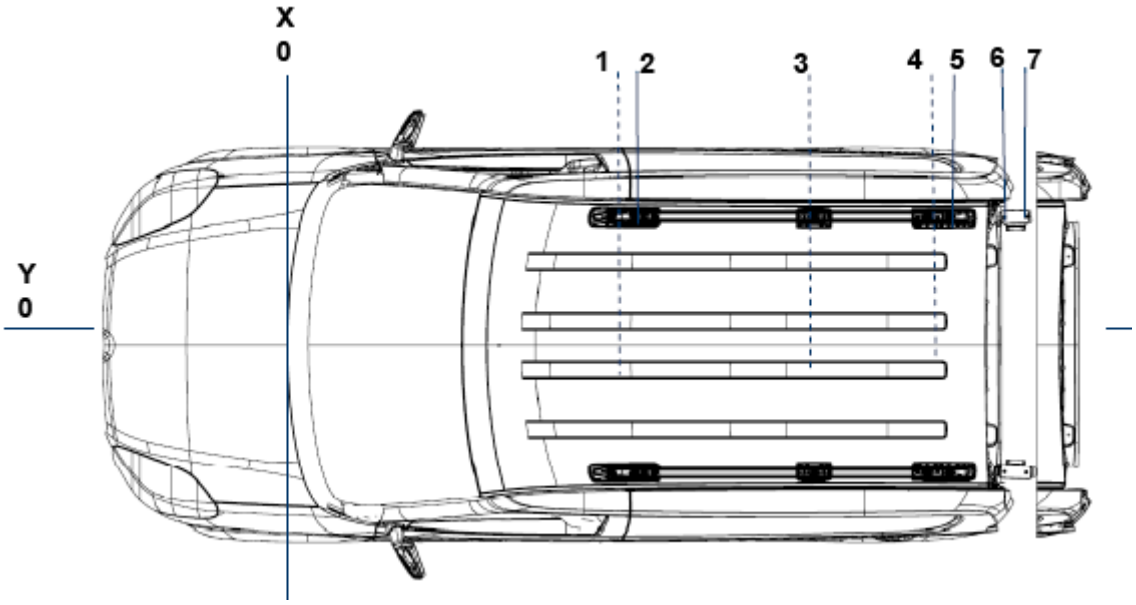
9. Roof – 10. Parcel rack mounting bracket – 11. Rivet – 12. Roof rack bars

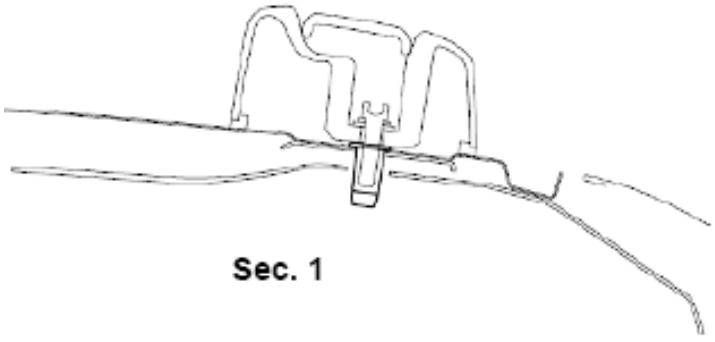
	Distance in X between points, mm							Distance in Y, mm
Position of fastening point	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
SWB Van	1472.5	99.9	815.2	514.2	100	-	-	1177.5
LWB Van	1472.5	99.9	815.2	-	-	864	100	1177.5

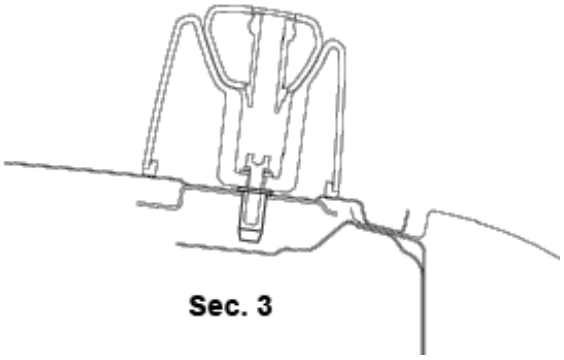
NOTE: Subject to errors and technical amendments. The electronic version of the Conversion Guidelines is the decisive source for the up-to-date data on Conversion Guidelines

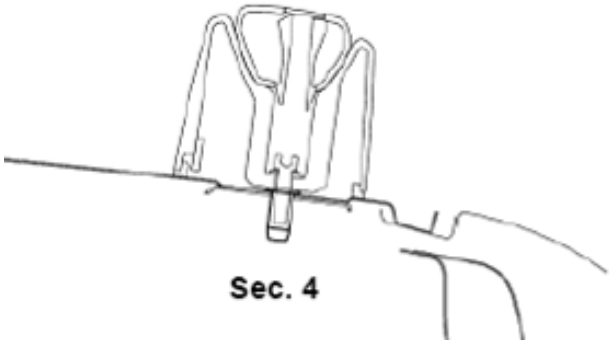
COMBO

Cross sections of parcel rack mounting points









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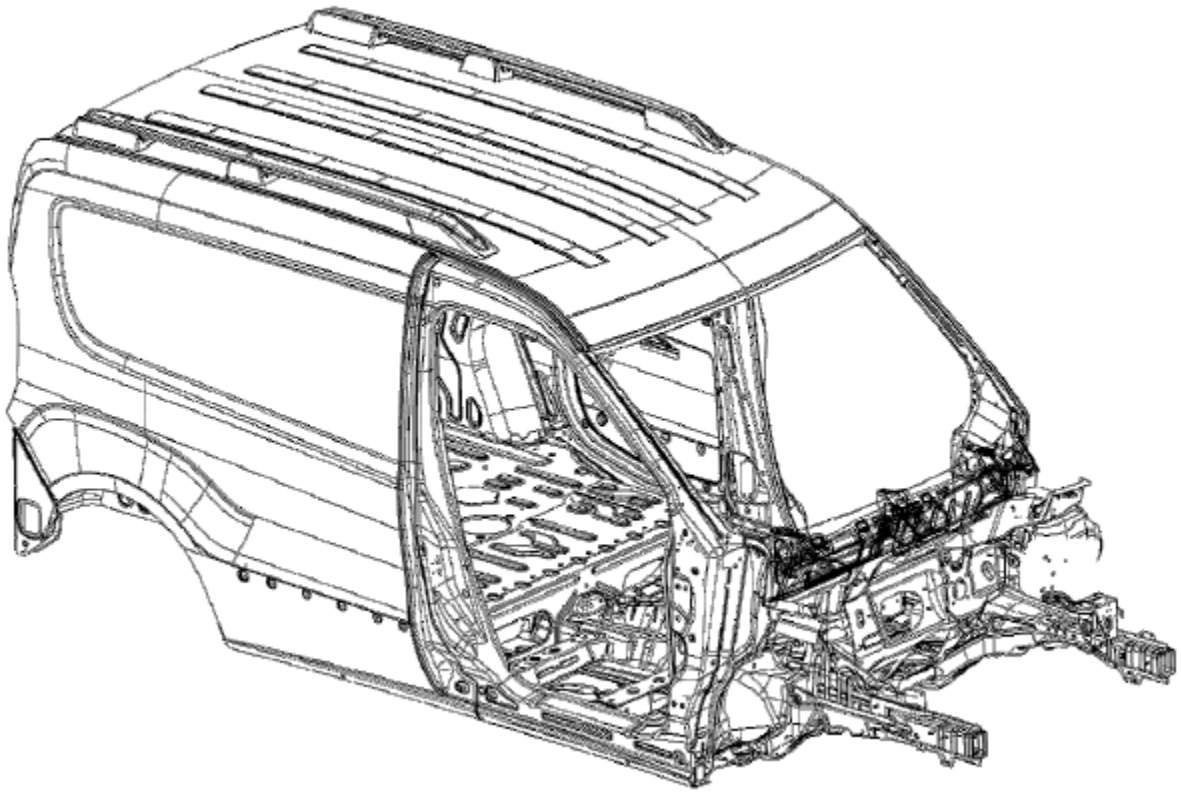

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COMBO

HEATER INSTALLATION

For vehicles without provision for additional heaters, the installation should take place in accordance with the instructions supplied by the manufacturer of the equipment (e.g. layout of boiler, piping, electrical equipment, etc.) and following the instructions given below.

All the national regulations on the subject should be complied with (e.g. inspections, special arrangements for transporting dangerous goods, etc.). The additional heating system should not use vehicle equipment that is subject to homologation; when the usage could adversely affect performance. In addition:

- Safeguard the correct operation of the vehicle components and systems (e.g.: engine cooling)
- Check that the capacity of the batteries and the power of the alternator are sufficient for the greatest current absorption. Make sure there is a protective fuse on the new circuit
- Connect the fuel system to an additional tank, located on the fuel return pipe to the engine, to collect the fuel. The direct connection to the vehicle tank is only permitted on condition that it is done independently of the engine supply and that the new circuit is perfectly sealed
- Define the routing of the pipes and the electrical wires, the positioning of the bracket and flexible couplings, bearing in mind the space that they take up and the effect of the heat on the various chassis components. Avoid routes and positions that could become dangerous in driving conditions and fit suitable shields, where necessary
- If water heaters are fitted, when the original vehicle heating and engine cooling circuits are involved, the following should be done in order to ensure the smooth operation of the system and guarantee the safety of the original system:
    - define the connection points between the additional system and the original system very carefully, possibly in agreement with the OEM
    - ensure that the positioning of the piping is functional, avoiding constrictions and siphon routes
    - fit the necessary deaeration valves (bleed points) to ensure the correct refilling of the system
    - make sure that the circuit can drain fully, fitting any additional plugs
    - where necessary, use suitable protection to limit heat loss
- With air heaters and in cases where they are located directly in the cab, take special care over the discharges (to prevent the combustion gases remaining inside the vehicle) and over the correct distribution of the hot air to avoid direct flows
- Take care to ensure that the entire system allows good accessibility for quick maintenance.

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COMBO
ELECTRICAL EQUIPMENT

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NOTE: Subject to errors and technical amendments. The electronic version of the Conversion Guidelines is the decisive source for the up-to-date data on Conversion Guidelines

COMBO
GLOSSARY OF TERMS

ACRONYM	DESCRIPTION
CCT	Chronotachograph Control Unit
CDC	Codriver Door Command
CGP	Door Management Control Unit (locks)
CRM	Trailer Control Unit
CRS	Additional Heater Control Unit (Webasto)
CSA	Anti-theft Alarm Control Unit
CSG	Power Steering Control Unit
CSP	Rain/Dusk Sensor Control Unit
CSS	Central Stack Switch
DDC	Driver Door Command
DEV	Steering Column Switch Unit
LSS	Left Stack Switch
NAB	Air Bag Node
NAS	Steering Angle Node
NBC	Body Computer Node
NCA	Automatic Transmission Node
NCL	Climate Control Node
NCM	Engine Management Node
NCV	Convergence Node (info-telematic system)
NFR	Braking Node (ABS, ASR, VDC)
NQS	Instrument Panel Node
NRR	Radio Receiver Node
NSC	Automatic Transmission Selector Node
NSP	Parking Sensor Node
NYL	Yaw Sensor Node

+30: +12V permanent power supply

+IGNITION: 12V signal activated when ignition key is in MAR (ON) position

+LIGHTS: +12V signal activated when side lights are on.

BATT. AUX: Additional battery installed by outfitter

P.M. Connector: Connector for receiving male terminals

P.F. Connector: Connector for receiving female terminals

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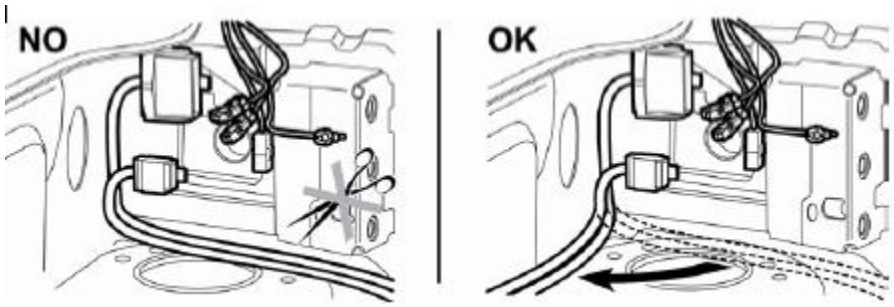
COMBO
CABLE COLOUR CODE

Code	Colour
A	Light Blue
B	White
C	Orange
G	Yellow
H	Grey
L	Blue
M	Brown
N	Black
R	Red
S	Pink
V	Green
Z	Purple
W	Light Brown

CHANGES TO HARNESS ROUTING

If it becomes necessary to move assemblies (various components, fuel tank, spare wheel, etc.) when fitting out or carrying out conversions, this is allowed as long as their operation is not compromised, the same type of original connection is restored and their transverse position on the frame is not substantially altered.
If an object needs to be installed near the routing of an original system cable or the routing needs to be changed, this is permitted as long as it is kept intact (not cut).



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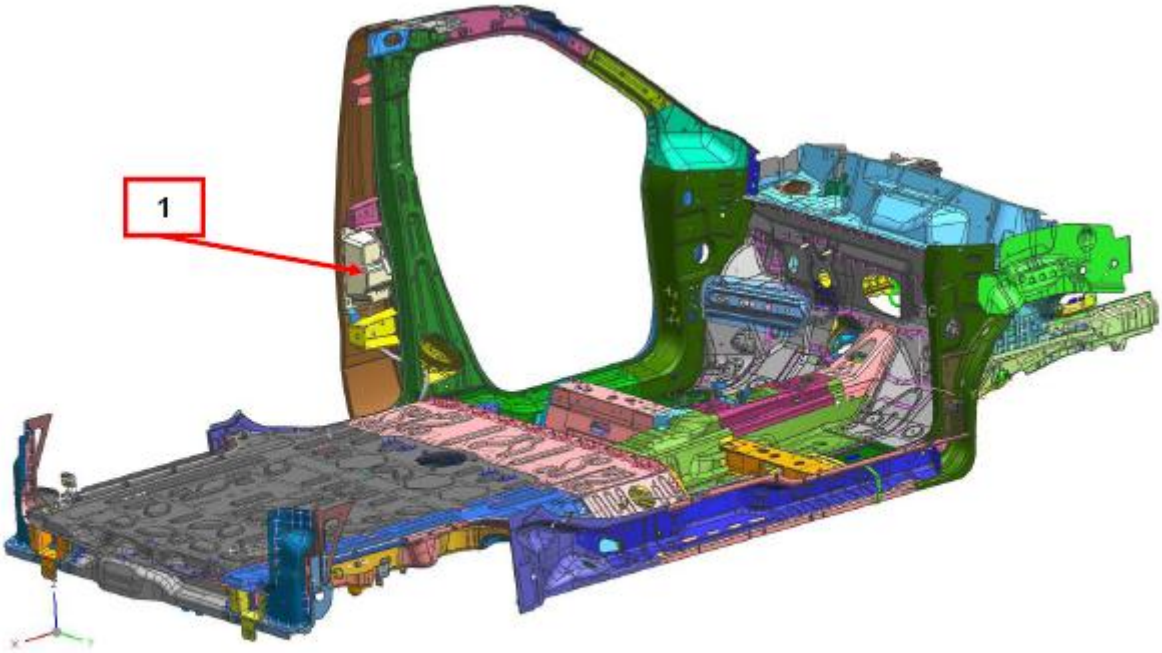
COMBO

PREPARATIONS FOR CONVERSION

For the effective and correct use, by converters, of the basic system on the vehicle, specific connection points have been prepared to be used for additional systems. The position is shown in the image below.

This preparation has been necessary in order to ensure that the basic design is not interfered or tampered with, to guarantee functional integrity and ensure that the warranty still applies.
In addition to the main connecting points for connection with additional systems, some subjects (dashboard control unit, battery, etc.) that belong exclusively to the basic system and are therefore not handled in any way by the outfitters, will be described to provide additional information.



1. Interface for outfitters

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COMBO

ADDITIONAL BATTERIES AND ALTERNATORS

The installation of electrical equipment that absorbs a lot of power (e.g. electric motors that are used frequently or electric motors used less frequently but for long periods and when the engine is not running such as tail lifts for town use) or a large number of additional electrical equipment may require power that the normal vehicle system is not capable of supplying. In these cases suitable capacity additional batteries should be used.

The vehicle system is designed to supply the necessary power for the equipment fitted which has special protection and the correct size cables. If additional equipment is fitted it should have suitable protection and the vehicle system should not be overloaded.

If an additional battery needs to be used in parallel to the one in series, it is advisable to use a more powerful alternator. In any case, the capacity of this battery should not be more than 20% of the capacity of the standard battery in order to prevent damage to some of the system components.

If modifications have to be made to the system other than those described in this manual (for example, the addition of several batteries in parallel), the OEM will have to be notified about the operation.

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COMBO

The following table contains information relating to the alternators for both standard versions and versions with OPT KX3 (up rated alternator).

Engine	Version	Alternator	
		Standard	OPT KX3
1.4 Petrol E5 S&S	Heated	51859044 Denso A115 105A	51859044 Denso A115 105A
	Air Conditioned	51859041 Denso A115 120A	51859041 Denso A115 120A
1.4 Turbo / CNG E5	Heated	51854899 Denso A115 105A	51854899 Denso A115 105A
	Air Conditioned	51854903 Denso A115 120A	51854903 Denso A115 120A
1.3CDTi E5 S&S	Heated	51854907 Denso A115 105A	51854912 Denso A115 120A
	Air Conditioned	51854912 Denso A115 120A	51854912 Denso A115 120A
1.6CDTi E5 S&S	Heated	51854901 Denso A115 100A	51808561 SC2 150A
	Air Conditioned	51854902 Denso A115 120A	51808561 SC2 150A
2.0CDTi E5 S&S	Heated	51854901 Denso A115 100A	51808561 SC2 150A
	Air Conditioned	51854902 Denso A115 120A	51808561 SC2 150A

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COMBO

Battery

When removing / refitting the standard battery, check that the gas/liquid drainage through the dedicated pipe is working properly.

If an additional battery is installed in the load compartment or in the passenger compartment it is possible to use

- Recombination batteries (AGM or gel)
- Traditional batteries

In both cases the battery must be suitably separated from the occupants of the vehicle by means of a container whose seal is guaranteed in the case of:

- The emission of vapours (for example, if the alternator voltage regulator is faulty)
- The battery explodes
- The escape of electrolyte fluid if the vehicle overturns (for type B batteries only)

In addition, if type A batteries are used, it is necessary to ensure there is a breather outside the housing compartment.

If type B batteries are installed, it is necessary to use batteries equipped with:

- A cover with an external gas evacuation system fitted with a small pipe to direct the acid spray outwards
- A flame anti-return system with a porous pad (flame arrestor)

It is also necessary to make sure that the gas evacuation is located well away from any areas where sparks might be created, from mechanical/electrical/electronic components and that the exhaust is positioned to prevent a vacuum being created inside the battery.

For connecting an additional battery, there is a two-way connection, about halfway up the left hand b-pillar. The earth connection for the additional battery requires a suitable section cable, which is as short as possible, using the dedicated points on the vehicle.

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COMBO

The table below contains the information relating to the batteries for both standard versions and versions with OPT KX3.

Engine	Version	Battery	
		Standard	OPT KX3
1.4 Petrol E5 S&S	Heated	51816427 Exide Battery 63Ah 450A L2 HD	51832153 Exide Battery 72Ah 600A L3 HD
	Air Conditioned		
1.4 Turbo / CNG E5	Heated	51810304 Mutlu Battery 50Ah 250A L1	51810306 Mutlu Battery 60Ah 380A L2
	Air Conditioned		
1.3CDTi E5 S&S	Heated	51816427 Exide Battery 63Ah 450A L2 HD	51832153 Exide Battery 72Ah 600A L3 HD
	Air Conditioned		
1.6CDTi E5 S&S	Heated	51832153 Exide Battery 72Ah 600A L3 HD	51832153 Exide Battery 72Ah 600A L3 HD
	Air Conditioned		
2.0CDTi E5 S&S	Heated	51832153 Exide Battery 72Ah 600A L3 HD	51832153 Exide Battery 72Ah 600A L3 HD
	Air Conditioned		

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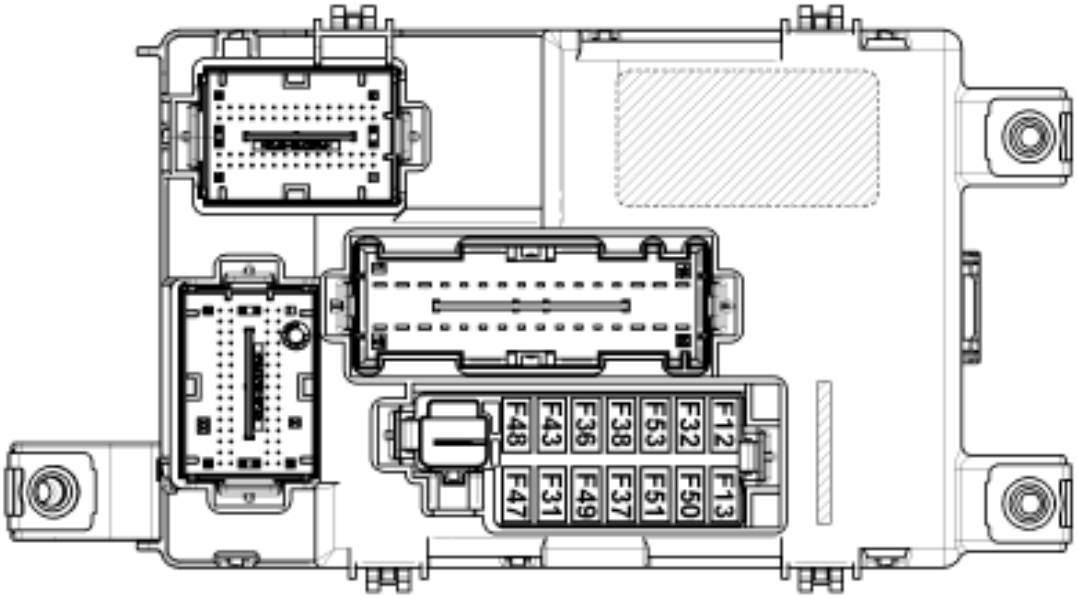
COMBO

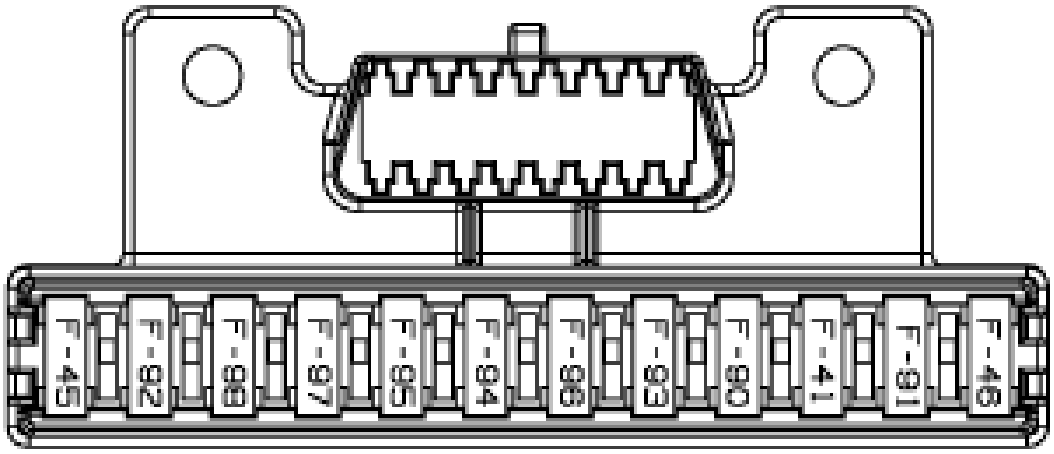
UNDER DASHBOARD FUSE BOX



	FUSE DEPLOYMENT	A
F12	RIGHT DIPPED HEADLIGHT	7.5
F32	FRONT AND REAR COURTESY LIGHTS, VISOR LIGHTS, DOOR LIGHTS, LUGGAGE COMPARTMENT LIGHT	7.5
F53	INSTRUMENT PANEL	5
F38	DOOR LOCKING/UNLOCKING MOTORS, DEAD LOCK ACTIVATION MOTORS, TAILGATE UNLOCKING MOTOR	20
F36	+BATT. POWER SUPPLY: FOR EOBD DIAGNOSTIC SOCKET, NCL, NRR, CSA, NCV	10
F43	TWO-WAY ELECTRIC PUMP (WINDSCREEN WASHER/REARSCREEN WASHER)	15
F48	PASSENGER SIDE WINDOW OPENING MECHANISM	20
F13	LEFT DIPPED HEADLAMP, HEADLAMP ALIGNMENT CORRECTOR	7.5
F50	NAB	7.5
F51	INT POWER SUPPLY FOR SWITCH IN BRAKE PEDAL (N.C. contact), CLUTCH PEDAL SWITCH, NCV, NCL, NRR	7.5
F37	INT POWER SUPPLY FOR INSTRUMENT PANEL, SWITCH ON BRAKE PEDAL (N.N. contact), THIRD BRAKE LIGHT	5
F49	INT POWER SUPPLY FOR CONTROL PANEL LIGHTING, PARKING SENSOR CONTROL UNIT, EXTERIOR ELECTRIC MIRRORS MOVEMENT	5
F31	INT/A POWER SUPPLY FOR RELAY COILS IN ENGINE FUSE JUNCTION UNIT AND RELAY COILS IN BODY COMPUTER CONTROL UNIT	5
F47	DIRVER'S WINDOW OPENING MECHANISM	20

NOTE: Subject to errors and technical amendments. The electronic version of the Conversion Guidelines is the decisive source for the up-to-date data on Conversion Guidelines

COMBO
PASSENGER COMPARTMENT WIRING BOX



	FUSE DEPLOYMENT	A
F94	REAR CURRENT SOCKET	15
F95	CIGAR LIGHTER	15
F96	PASSENGER COMPARTMENT CURRENT SOCKET	15
F97	HEATED DRIVER'S SEAT	10
F98	HEATED PASSENGER SEAT	10

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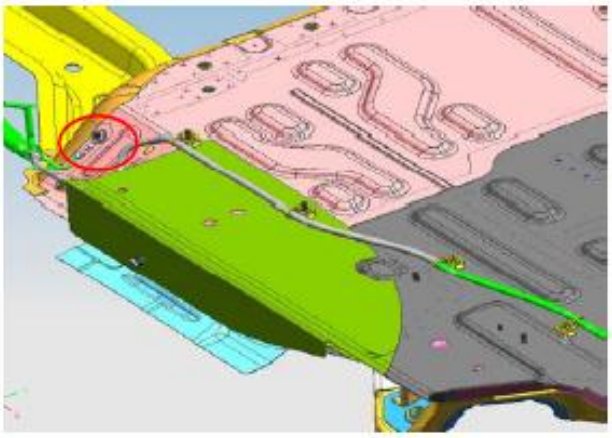
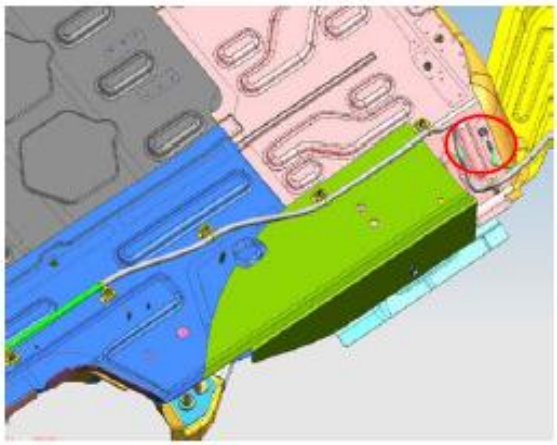
COMBO
EARTH POINTS



Left side



Right side

Left pillar, near the outfitter's interface

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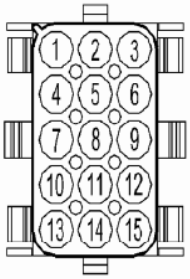
COMBO
CONNECTOR C036 LA (15-WAY) BODYWORK SOCKET



Pin	Function / Connector Part Number	Min cable section [mm²]	Cable colour	Notes
	Connector at 15-way Tyco wiring p/n 926647-1 , 15-way Tyco counterpart p/n 1-480710-0			
1	Additional brake light	0.5	VR	P_{MAX}=21W at 12V
2	D+ (activated to earth)	0.35	HM	I_{MAX}=300mA
3	Vehicle speed repetition (VSO)	0.35	VM	I_{MAX}=xmA
4	Locks locking command	1.5	BN	I_{MAX}=xmA (See Table 1 for the activation times)
5	Locks unlocking command	1.5	Z	I_{MAX}=xmA (See Table 1 for the activation times)
6	Side and rear door status signal	0.35	BH	Use an (N.A.) normally open to earth switch (minimum contact cleaning current 10mA)
7	20 W SBMT timed power supply driver for courtesy lights	0.5	RN	Power supply (+) for timed courtesy lights 15' at key off (P_{MAX}= 20W at 12V)
8	Courtesy lights negative control (dimmed)	0.5	MC	Control for courtesy lights (-) (P_{MAX}= 20W at 12V)
9	B-CAN A	0.35	B	Preparation for manufacturer accessories line anti-theft device
10	B-CAN B	0.35	L	Preparation for manufacturer accessories line anti-theft device
11	Not connected	-	-	-
12	A/C request	0.35	MV	Air conditioning engagement positive signal I_{MAX}= 300mA
13	Power supply at key on (+IGNITION)	0.5	LC	I_{MAX}=600mA
14	Not connected	-	-	-
15	Not connected	-	-	-

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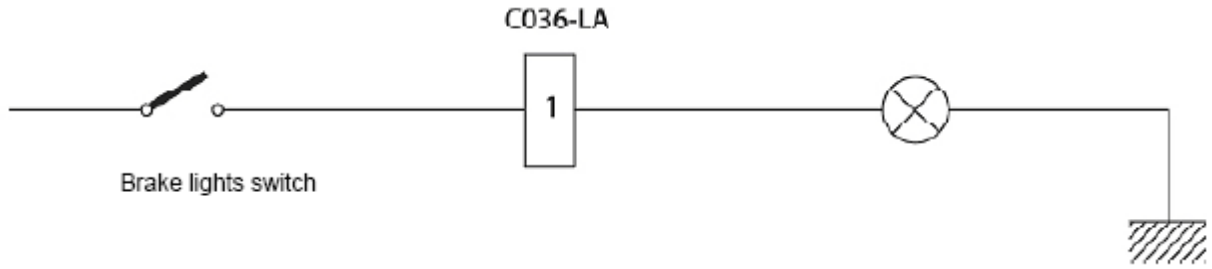
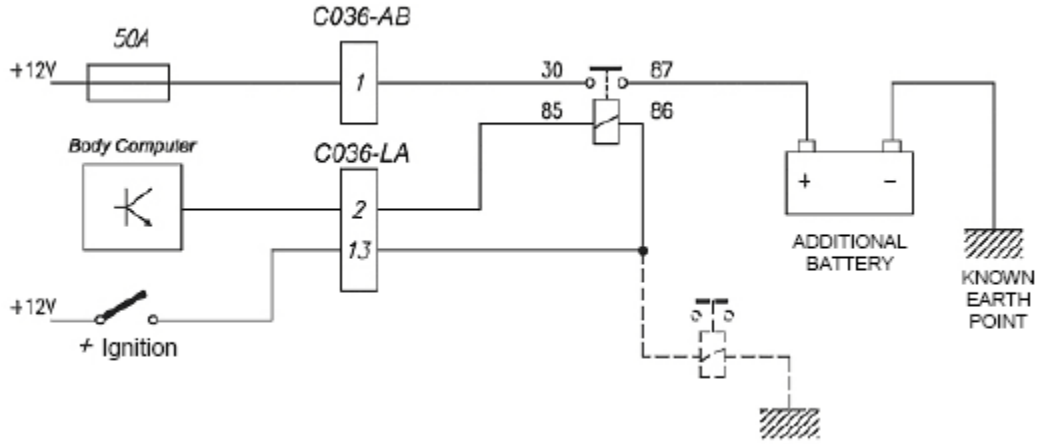
COMBO

Additional brake light (3rd brake light)



Earth point nearest the component: choice between A, B, C or pin 2 connector C036-AB

Recharging in progress signal (D+)



Earth point nearest the component: choice between A, B, C or pin 2 connector C036-AB

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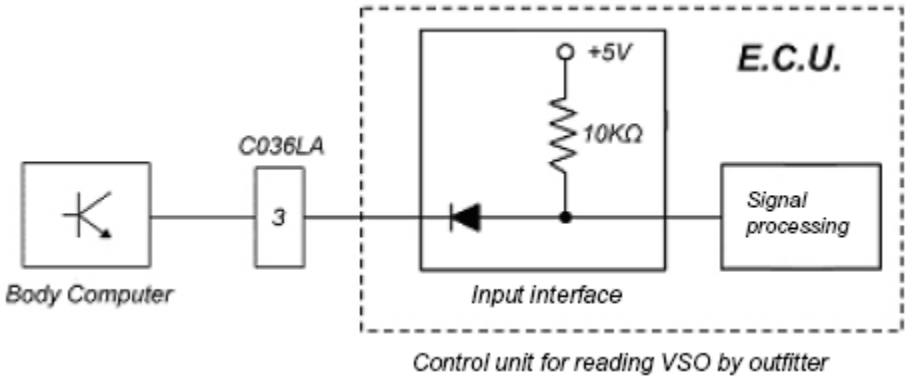
COMBO

Vehicle speed signal (VSO)

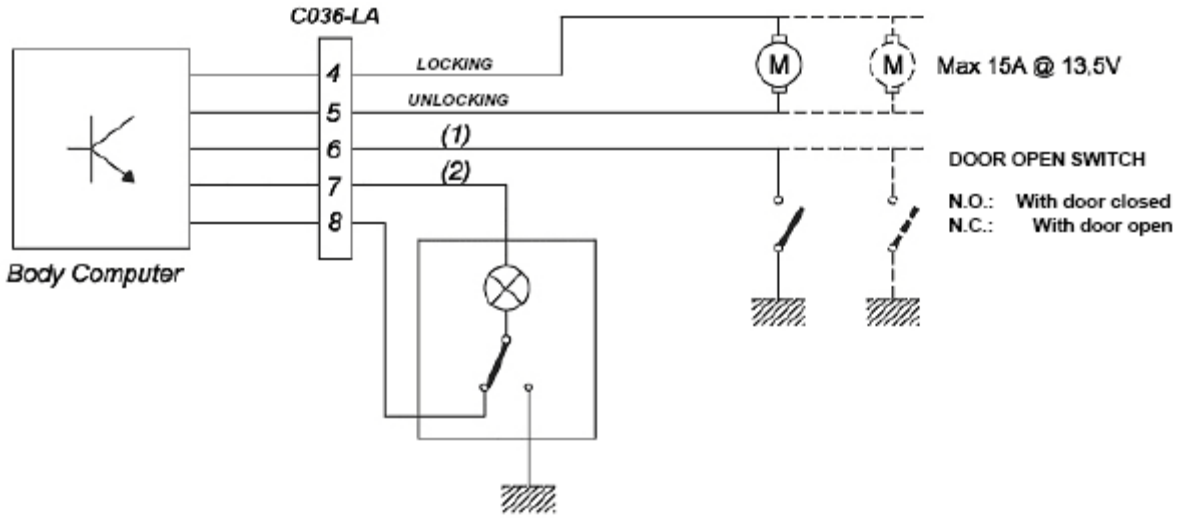


The VSO signal is defined as 275,714 mm/pulse and therefore the speed for the receiver is equal to:

V.vehicle [mm/s] = Frequency VSO [Hz] * 275,714 [mm/pulse]

When the vehicle speed is equal to 0km/h the VSO signal digital level is high and 0 pulse/s, on the other hand, when the vehicle signal is not valid, the VSO signal digital level is low

Rear courtesy lights and locks control



Earth point nearest the component: choice between A, B, C or pin 2 connector C036-AB

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Note (1): If there is no door open switch (if original locks are not used, see chapter 6), pin 6 for connector C036LA can be left disconnected.

Warning: if the rear lock(s) can also be locked with the door(s) open, the instrument panel will not signal the status of the rear door(s) and the rear courtesy light will not be operated. It will therefore be the responsibility of the converter to notify the customer of the different operation from the description in the Owner Handbook.

Note (2): pin 7 of connector C036LA provides a +12V power supply activated for 15 minutes after the key is switched off (+IGNITION= off), therefore after this period has elapsed the rear courtesy light can no longer be used until the status of the rear door open switch (where fitted) changes, or the locks are unlocked or the key turned back on (+IGNITION= on).

- Operation with 2 button remote control: unlocking of all the locks and all courtesy lights turned on at the same time
- Operation with 3 button remote control: separate front/rear unlocking and related courtesy lights turned on separately.

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Action	Door Lock	Fr Door Unlock-common	Rr Door Unlock-common	DL Set	Act. Time	Front State	Rear State	DL State
Central Lock								
Initial State	-	-	-	-		Any	Any	Any
Lock	+	-	-	-	400 + t_1 ms			
Final State	-	-	-	-		Locked	Locked	No change
Unlock Front (in case of vehicle partially unlocked)								
Initial State	-	-	-	-		Locked	Any	Any
Unlock Front	-	+	-	-	400 + t_1 ms			
Final State	-	-	-	-		Unlocked	No change	No change
Unlock Rear (in case of vehicle partially unlocked)								
Initial State	-	-	-	-		Any	Locked	Any
Unlock Rear	-	-	+	-	400 + t_1 ms			
Final State	-	-	-	-		No change	Unlocked	No change
Unlock Front + DL unset (in case of vehicle completely locked)								
Initial State	-	-	-	-		Locked	Any	Any
Confirm Lock Front/Rear	+	-	-	-	20 + t_2 ms			
Dead-Lock Elimination	+	+	+	-	200 + t_2 ms			
Unlock Front	-	+	-	-	400 + t_1 ms			
Final State	-	-	-	-		Unlocked	Locked	Removed
Unlock Rear + DL unset (in case of vehicle completely locked)								
Initial State	-	-	-	-		Any	Locked	Any
Confirm Lock Front/Rear	+	-	-	-	20 + t_2 ms			
Dead-Lock Elimination	+	+	+	-	200 + t_2 ms			
Unlock Rear	-	-	+	-	400 + t_1 ms			
Final State	-	-	-	-		No change	Unlocked	Removed
Unlock Front/Rear + DL unset (in case of vehicle completely locked)								
Initial State	-	-	-	-		Any	Any	Any
Unlock Fr/Rr & Dead Lock Elimination	-	+	+	-	600 + t_1 ms			
Final State	-	-	-	-		Unlocked	Unlocked	Removed
Lock Front/Rear + DL set								
Initial State	-	-	-	-		Any	Any	Any
Lock Front/Rear	+	-	-	-	400 + t_1 ms			
Dead Lock insertion	-	-	-	+	200 + t_1 ms			
Final State	-	-	-	-		Locked	Locked	Activated

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DL elimination only								
Initial State	-	-	-	-		Locked	Locked	Activated
Confirm Lock Front/Rear	+	-	-	-	20 + t_2 ms			
Dead-Lock Elimination	+	+	+	-	200 + t_1 ms			
Confirm Lock Front/Rear	+	-	-	-	20 + t_2 ms			
Final State	-	-	-	-		Locked	Locked	Removed

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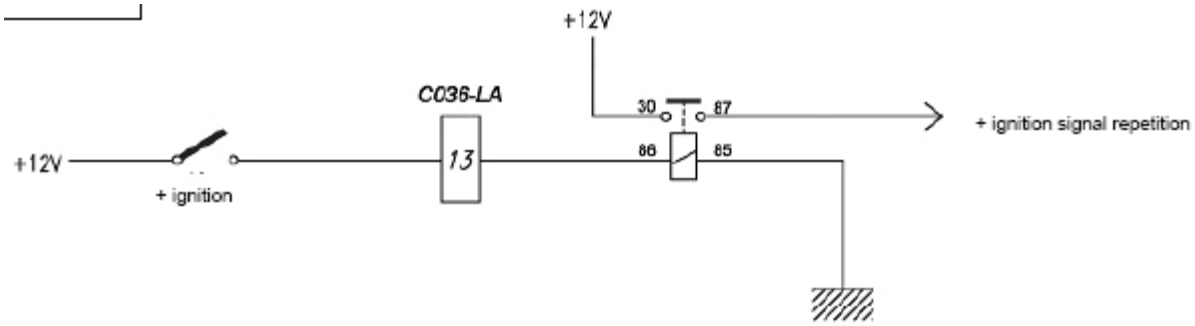
COMBO

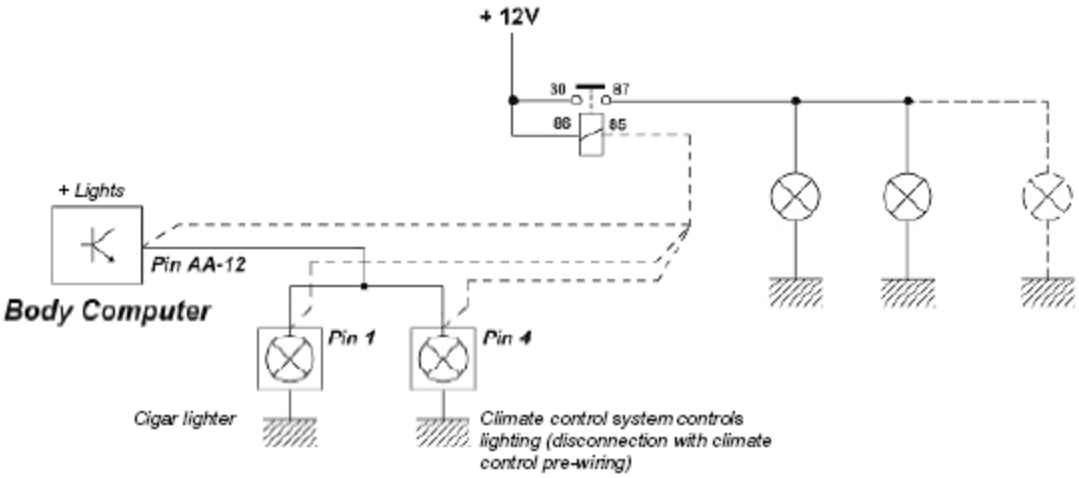
Key in ON position signal (+IGNITION)

If the +IGNITION signal needs to be replicated, for example to operate loads with a total current > 600mA, it is advisable to create the following circuit



Earth point nearest the component: choice between A, B, C or pin 2 connector C036-AB

Instructions for connecting side marker lights



Earth point nearest the component: choice between A, B, C or pin 2 connector C036-AB

It is advisable to use a relay with a typical absorption of 200mA, derived from the cigar lighter socket lighting, to connect the side marker lights.

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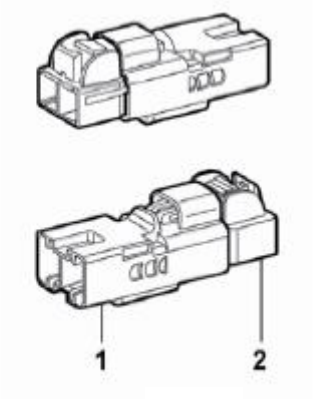
COMBO
CONNECTOR C036-AB (2-WAY) BODYWORK SOCKET



1. 2-way connector C036-AB – 2. Connector supplied for the outfitter to wire

Connector functions

Pin	Function / Connector Part number	Min cable section [mm²]	Cable colour	Notes
	Connector at 2-way MTA wiring p/n 45.4030/10 2-way MTA counterpart p/n 45.40405			Reference diagram C036-AB
A	+30 power supply	10	R	50A fuse rated current
B	Power earth	10	N	53A max continuous current

Power earth (pin 2)
The earth points on the chassis can be used as an alternative. Protect the additional cables inside special sheaths or corrugated protection. The minimum section of the cables should always be the same as recommended in the tables

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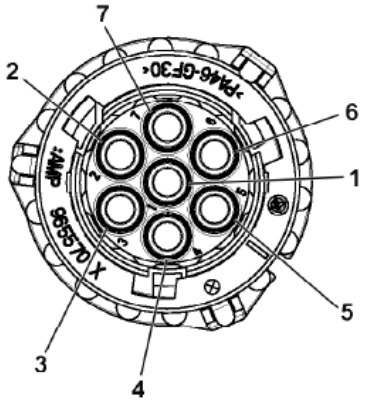
COMBO

REAR LIGHT CONNECTORS

Van / Tour rear lights



Left

Pin	Function / Connector Part number	Min cable section [mm²]	Notes
	Left rear light cluster - Connector at 7-way Tyco wiring p/n 967650 (adaptor at 90° for corrugated protection p/n 965783-1)		
1	Bulb earth	1	
2	Rear fog lamp	0.75	1x 21W - 12V bulb
3	Reversing light	0.5	1x 16W - 12V bulb
4	Side light	0.5	1x 5W - 12V bulb
5	Brake light	0.5	1x 21W - 12V bulb
6	Direction indication	0.5	1x 21W - 12V bulb
7	Not connected	-	

Right

Pin	Function / Connector Part number	Min cable section [mm²]	Notes
	Right rear light cluster - Connector at 7-way Tyco wiring p/n 967650-1 (adaptor at 90° for corrugated protection p/n 965783-1)		
1	Bulb earth	1	
2	Brake light	0.5	1x 21W - 12V bulb
3	Reversing light	0.5	1x 16W - 12V bulb
4	Not connected	-	
5	Rear fog lamp	0.75	1x 21W - 12V bulb
6	Direction indication	0.5	1x 21W - 12V bulb
7	Side light	0.5	1x5W - 12V bulb

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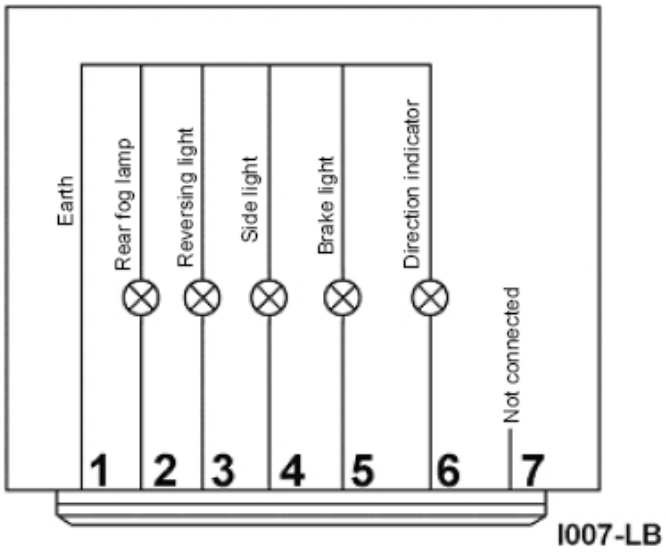
COMBO

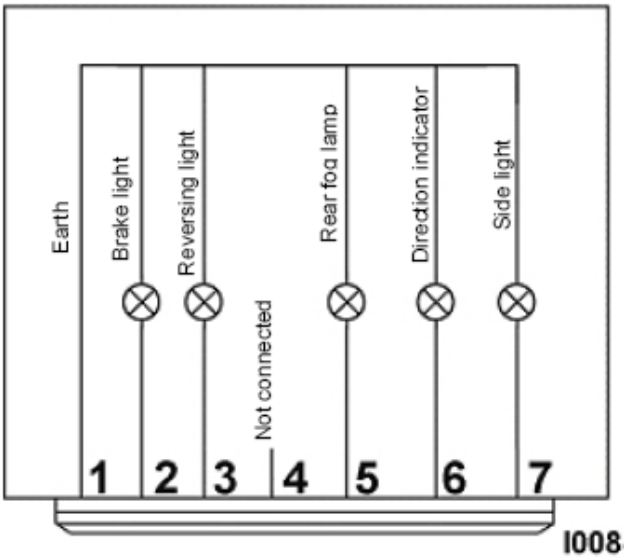
Flatbed rear lights

Left



I007-LB

Right



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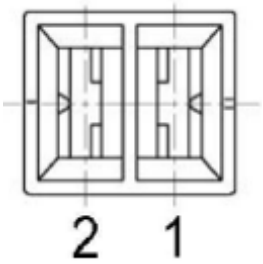
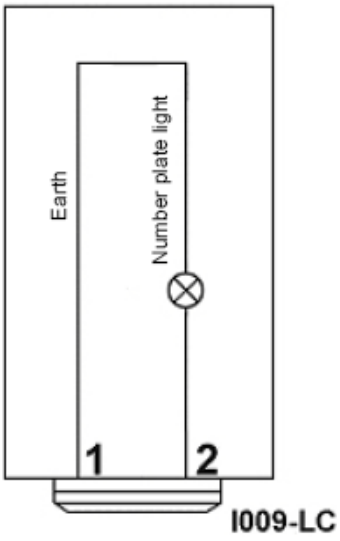
COMBO

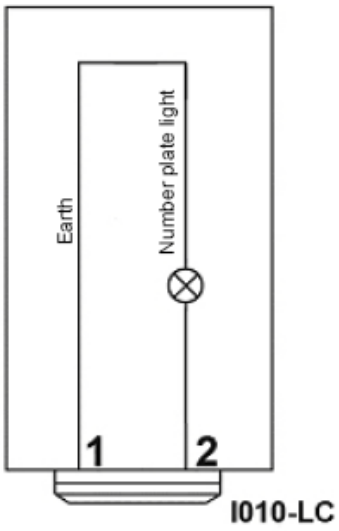
Number plate light connectors



Left flatbed number plate light



Right flatbed number plate light



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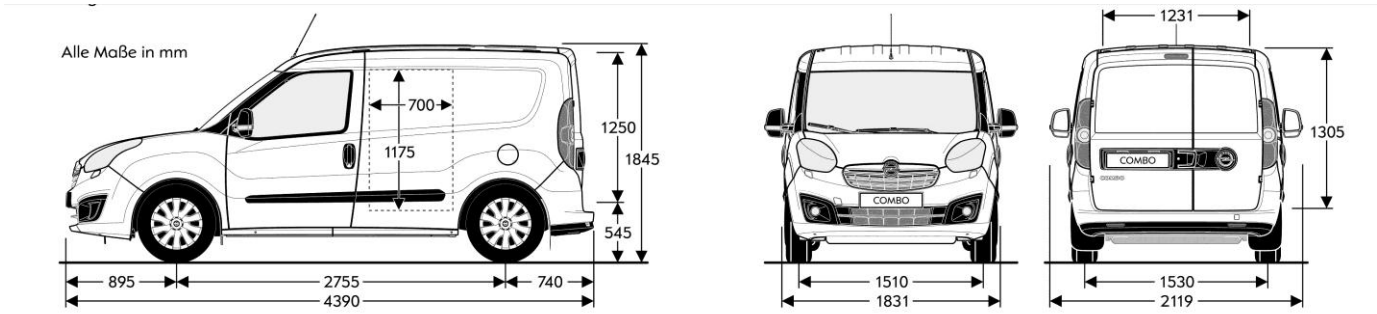
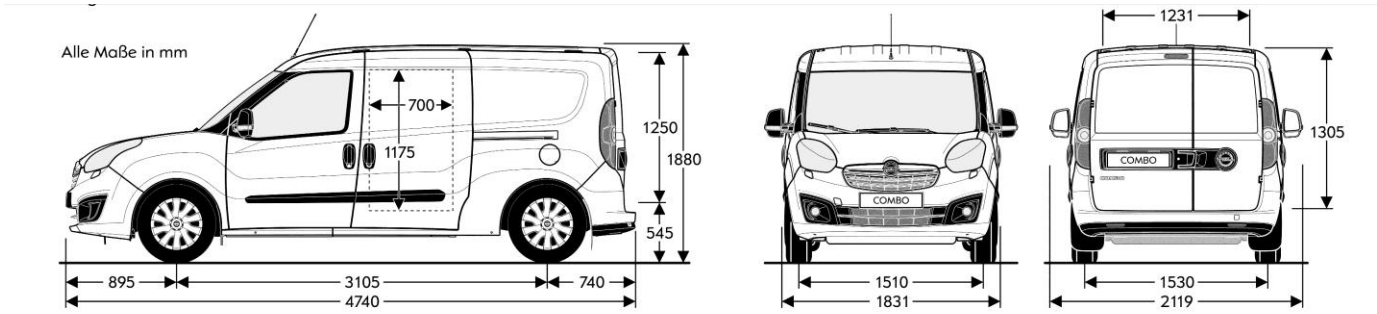
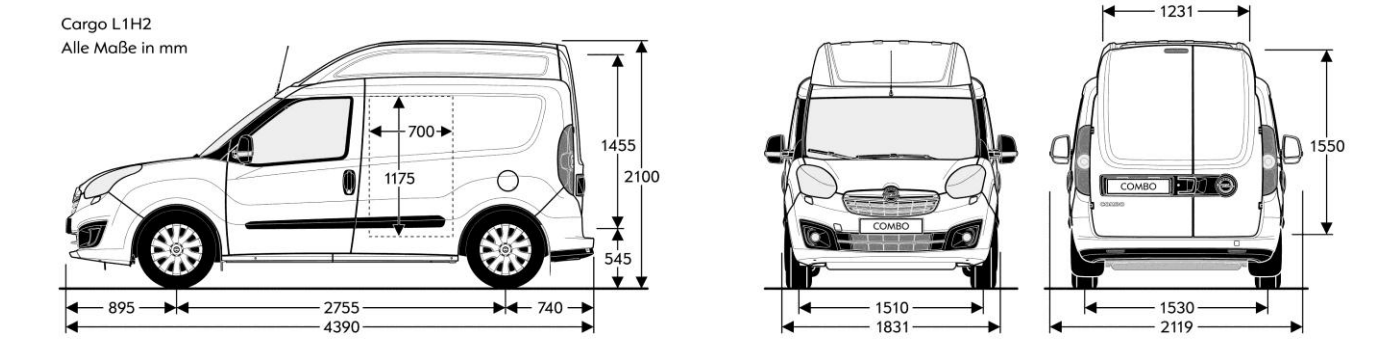
COMBO
MAIN DIMENSIONS
SWB Van.



LWB Van.



SWB, high roof Van.



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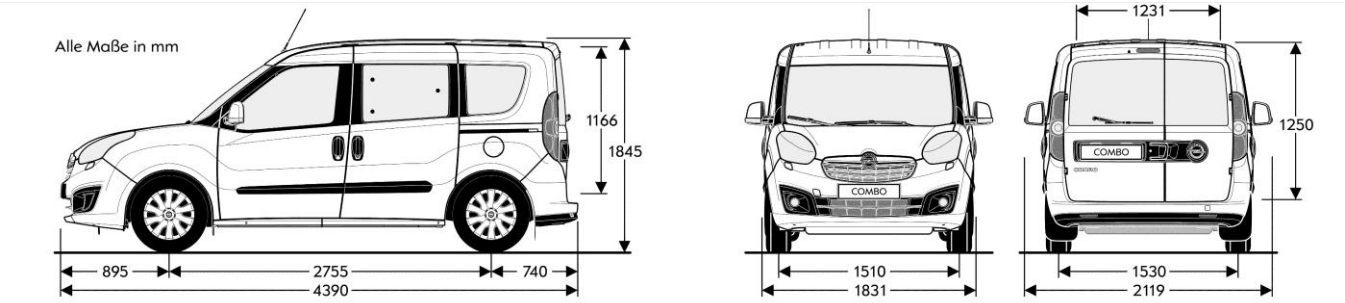
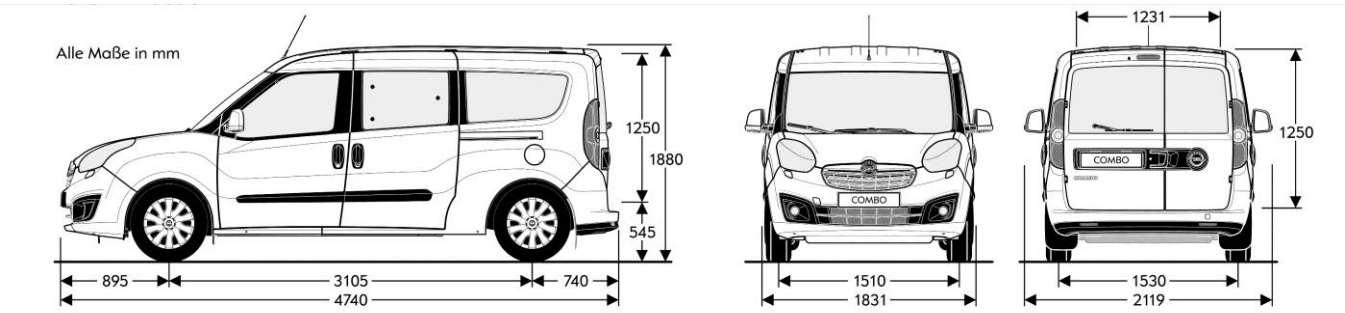
COMBO

SWB Tour N1.



Long wheelbase Tour N1 versions



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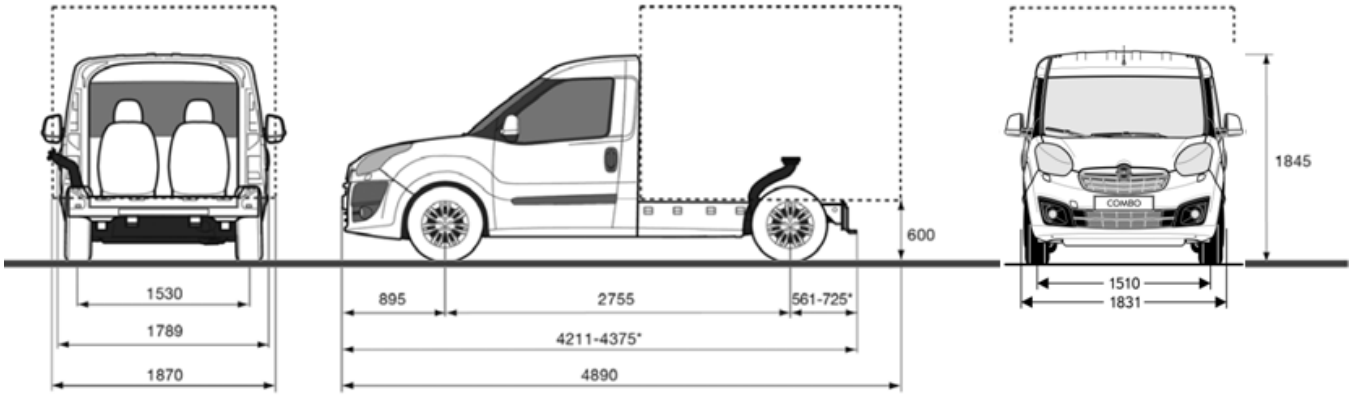
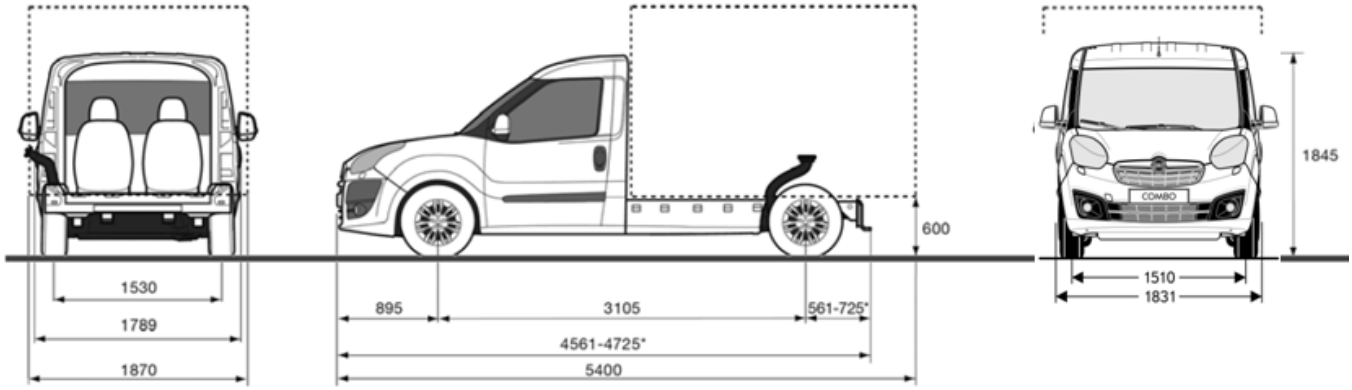
COMBO

Short wheelbase flatbed versions



Long wheelbase flatbed versions



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